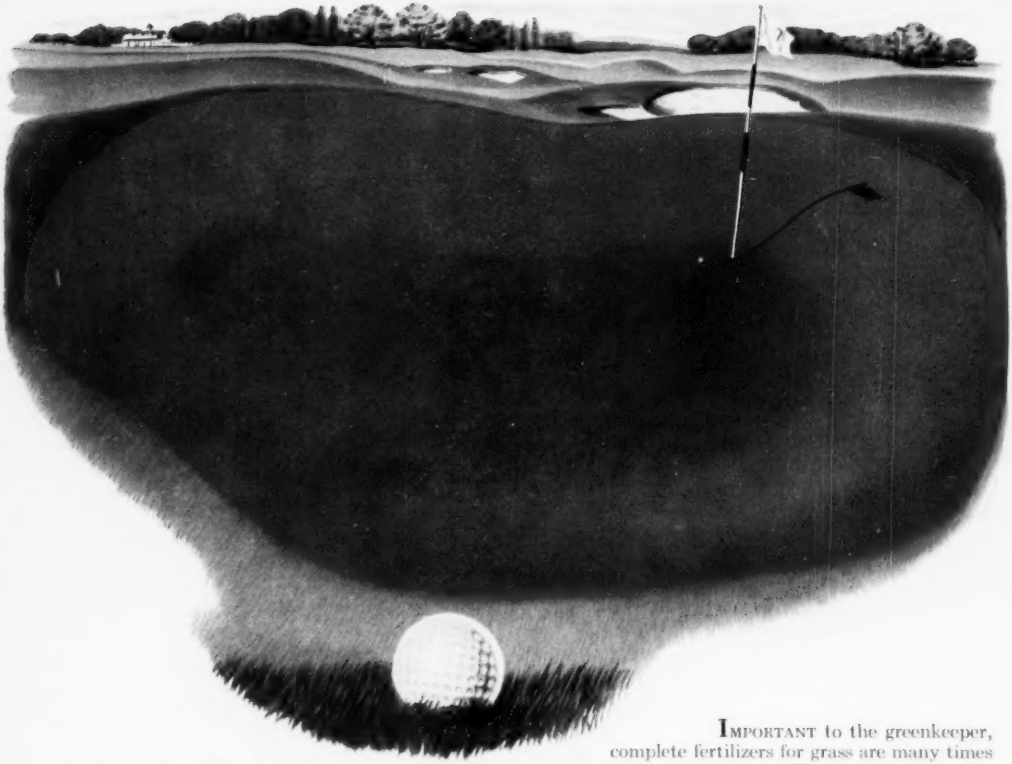
COMMERCIAL FERTILIZER

CONSOLIDATED WITH THE FERTILIZER GREEN BOOK



What makes a green *Greener?*

IMPORTANT to the greenkeeper, complete fertilizers for grass are many times more important to the farmer. The fertilizers that grow a thick carpet of deep-green turf on America's golf courses also increase America's supply of wholesome, nutritious food. These facts are featured in the most recent of a series of Barrett advertisements in The Saturday Evening Post and Fortune directing attention to the service of the fertilizer industry.

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ALLIED CHEMICAL & DYE CORPORATION

Barrett NITROGEN*

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*Reg. U. S. Pat. Off.

NOVEMBER, 1950

Service

H. J. BAKER & BRO.
100
YEARS OF
SERVICE

WHEN a representative of H. J. Baker & Bro. talks about service, let him tell you how this service could work for you. For over a century, this firm has built up a reputation for the right materials when you want them. In order to be able to furnish these materials, when needed, the firm has contacts with sources of supply throughout the world.

For the type of service that represents not only the seller—but the buyer as well, it will pay you to consult H. J. Baker & Bro. Make it a point to inquire next time you're in the market for our type of products. We are no farther from you than your telephone.

H. J. BAKER & BRO.
PRODUCTS
for the
FERTILIZER INDUSTRY

SULPHATE OF AMMONIA
CASTOR POMACE
COCOA PRODUCTS
NITROGENOUS
POTASH SALTS
SUPERPHOSPHATE
NITROGANIC TANKAGE
(Dried Activated Sewage Sludge)

H. J.
BAKER
& BRO.

271 MADISON AVENUE • NEW YORK 16, N. Y.
BALTIMORE, MD. CHICAGO, ILL. SAVANNAH, GA. TAMPA, FLA.

SMIROW

TANKAGE

Makes Plants GROW!

Farmers are looking for ways to cut the cost of producing crops. Acreage allotments necessitate larger yields. To meet those requirements, farmers demand quality fertilizers to make plants grow. Correct proportions of SMIROW TANKAGE as a nitrogen source assure QUALITY because SMIROW TANKAGE is 100% natural organic . . . 90% water insoluble and 90% available. It is always in perfect mechanical condition and uniform in texture and color.

To help make your sales grow, write for samples and prices.

SMITH-ROWLAND COMPANY

NORFOLK, VIRGINIA • CHEMICAL, ILLINOIS

U·S·S Ammonium Sulphate

for drillable mixed fertilizers

● Next to the increased yields they make possible, there's nothing more important to farmers than the way mixed fertilizers behave in the drills and other distributing equipment.

When you use U·S·S Ammonium Sulphate to supply the necessary nitrogen content, you give your customers a highly-drillable mixed fertilizer. U·S·S Ammonium Sulphate itself is a carefully-dried material. And, after mixing, it combines with the superphosphate to form small quantities of hygroscopic calcium sulphate; this takes up any moisture present and keeps the product dry.

Besides maintaining high drillability, U·S·S Ammonium Sulphate provides nitrogen that resists leaching and won't wash out of the soil, yet is completely available to growing plants.

You'll find U·S·S Ammonium Sulphate a valuable ingredient in giving your customers the finest mixed fertilizers they can obtain.

BAGGED FOR DIRECT APPLICATION

Here's a valuable addition to your line of mixed fertilizers—U·S·S Ammonium Sulphate in 100-pound bags for direct application. It's in heavy demand for top dressing, side dressing and plow-under uses. We'll provide you with free literature addressed to dealers and farmers to help you build sales of bagged U·S·S Ammonium Sulphate.

CONTACT OUR NEAREST SALES OFFICE

For complete information on U·S·S Ammonium Sulphate in bulk or 100-pound bags, get in touch with the nearest of our five sales offices. Your inquiry will receive prompt and careful attention.

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USS TRADE MARK

AMMONIUM SULPHATE

UNITED STATES STEEL

Solve Your Checkweighing Problems with This NEW EXACT WEIGHT Scale . . .

Here is a new EXACT WEIGHT high-speed precision scale designed for checkweighing filled bags. Handles either valve pack type bag which comes down conveyor and crosses scale on its side or open mouth type bag in upright position. Scale is set in conveyor line after filling machine. Each bag is weighed; correct bags going to sewing machine, over and underweight bags removed for trimming. Features are (1) checkweighs each bag (2) fits into any production line (3) illuminated dial that warns operator when filling machine adjustments should be made (4) standard capacity to 100 lbs, more weight if needed. For full details write for circular covering EXACT WEIGHT Model #1302-R.

Model
#1302-R

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in all Principal Cities
from Coast to Coast
and Canada.

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Industrial Precision
THE EXACT WEIGHT SCALE COMPANY

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COMMERCIAL FERTILIZER

ESTABLISHED 1910 — November, 1950

Vol. 81, No. 5

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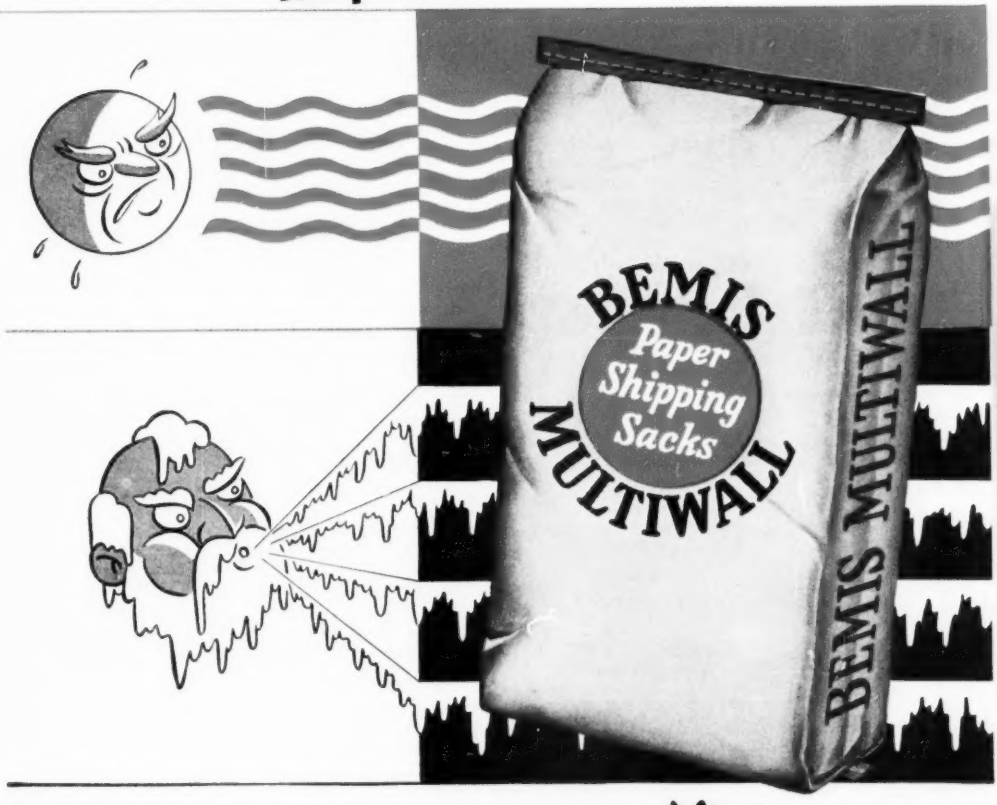
Be Multiwall Wise

Acclimatize

Keep Bags From Getting Thirsty



Multiwall Paper Shipping Sacks are amazingly tough. They don't need to be pampered. But they *do* need reasonable care. Unless they're protected against moisture loss, they dry out and can't work their best when being packed, closed, or handled. In some sections of the country "drying out" may happen in winter, in other sections during the summer, depending on the humidity. But it's a simple matter to keep Multiwalls from getting thirsty. Bemis Multiwall Specialists show you how.

Bemis BEMIS BRO. BAG COMPANY

"America's No. 1 Bag Maker"

PEORIA, ILL. • EAST PEPPERELL, MASS. • SAN FRANCISCO, CALIF. • WILMINGTON, CALIF.
MOBILE, ALA. • VANCOUVER, WASH. • HOUSTON, TEXAS

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Indianapolis • Jacksonville, Fla. • Kansas City • Los Angeles • Louisville • Memphis • Minneapolis
New Orleans • New York City • Norfolk • Oklahoma City • Omaha • Phoenix • Pittsburgh • St. Louis
Salina • Salt Lake City • Seattle • Wichita

MAIL THIS COUPON TODAY!

BEMIS BRO. BAG CO., 408 Pine St., Pine [illegible] St. Louis 2, Mo.

- ☐ Have Multiwall Specialist give information on care of bags.
- ☐ Send information on Multiwall specifications

Name _____

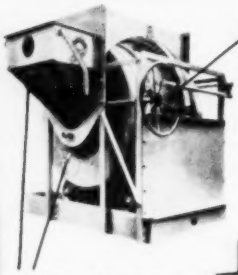
Company _____

Address _____

City _____ Zone _____ State _____

NOW increase your production with ***AUTOMATIC*** control of charging and discharging

WORTHINGTON-*Ransome* FERTILIZER MIXER



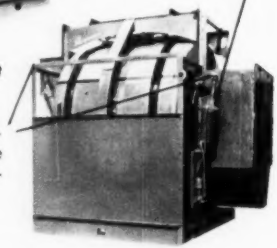
Manually-operated controls for charging gate and discharge chute

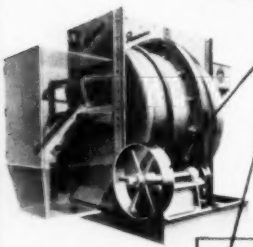
OR

Air-operated cylinders for automatic or push-button control

Large clean-out manholes

Automatically-operated double hammer attachment





Belt drive

OR

Direct Electric Motor Drive

Standard sizes— ½, 1, 2-ton capacity

FOR BULLETIN, WRITE

WORTHINGTON

WORTHINGTON PUMP AND MACHINERY CORPORATION
RANSOME INDUSTRIAL MIXER DIVISION
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Burlap and Cotton
New and Used
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SUPERIOR QUALITY
RELIABLE SERVICE

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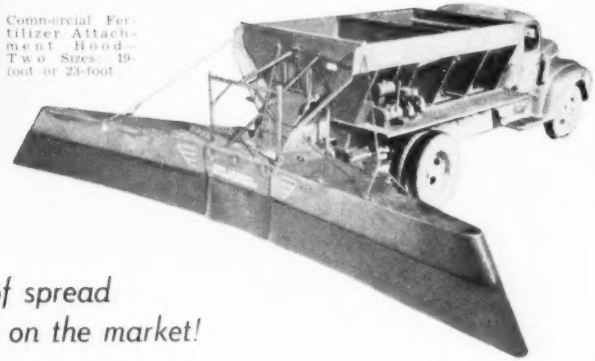
Isaac T. Rhea, Pres.

Savannah • New Orleans • Houston

TEXTILE BAG SPECIALISTS SINCE 1885

Here's the answer to your Spreading Problems!

AGAIN! "The NEW LEADER" leads the field



Commercial Fertilizer Attachment Hood—Two Sizes: 19-foot or 23-foot

with its new motor-driven Spreader offering greater accuracy of spread with the most positive feed on the market!

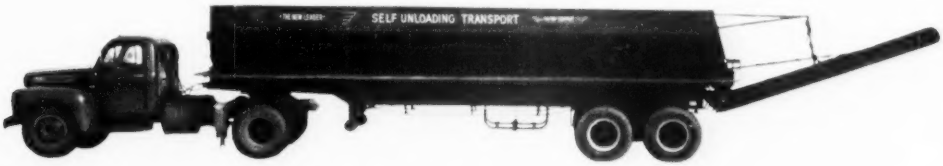
SPECIAL ADVANTAGES– Uniformity of spread is not dependent on truck speed. Motor is mounted on catwalk and drives only the twin distributor discs at a constant speed, assuring full width of spread at all times together with uniform distribution.

Conveyor is separately driven from truck drive shaft by a series of V-belts to deliver the correct amount per acre—regardless of truck speed or regardless of whether the truck is driven in low, super-low or any other gear.

Conveyor speed is, therefore, positively synchronized with speed of the rear wheels of truck and at each revolution of the rear wheels, the conveyor moves a given distance regardless of the truck's speed. Amount of material delivered by conveyor does not vary with hilly or soft field conditions.

Spreader Body Lengths (inside measure) are 9', 11', 13' and 15'. Other body lengths on special order.

Note: When Spreading Attachment is folded up for road-traveling position, width is approximately 7'-5".



"The NEW LEADER" Self-Unloading Bulk Transport

Size above, 30-foot length (exclusive of elevator), total capacity 23.7 cu. yds. Conveyor and elevator driven by gas engine. Available in other sizes from 15-ft. to 30-ft.

Special Feature: Transport is a self-powered unit. A 13 H.P., air-cooled gas engine operates conveyor and elevator independently of truck power when unloading at plant or filling trucks at delivery points. Suitable for hauling bulk material such as lime, commercial fertilizer, super and rock phosphate, sand, coal, corn, grain, feeds, etc. Adaptable to hauling bagged, packaged goods, etc.

Write today for specifications, prices, etc.

HIGHWAY EQUIPMENT COMPANY, INC. CEDAR RAPIDS, IOWA

MANUFACTURERS OF THE WORLD'S MOST COMPLETE LINE OF SPREADERS

JUST AROUND THE CORNER

By Vernon Mount

The war has only started. Americans must face the fact that we may be in and out of a war for the next 10 years, as I have stated many times in these letters. The boys cannot be pulled home without running into the danger of repeating what happened when the Korean war broke out.

Belts must be tightened. The program of reducing the American standard of living which has been predicted for some months in these letters, is under way. The radical changes in down payment and shortening the installment period are just a first step in cutting down things the American people are going to be able to buy.

"Non-Essential" is the key word. You are going to find more and more from now on Washington will interpret consumer goods as non-essential and will allocate materials and it is imperative that your trade associations keep a keen eye on this word "non-essential" lest equipment which you urgently need is thus classified.

They are gathering speed in the direction of the controls which these letters have been predicting, and you will begin to feel these controls soon. They may be hard to take in a time when apparently we are not in war, but every business man and citizen must get used to the idea and work with it in the interest of the long range picture.

Yours faithfully,

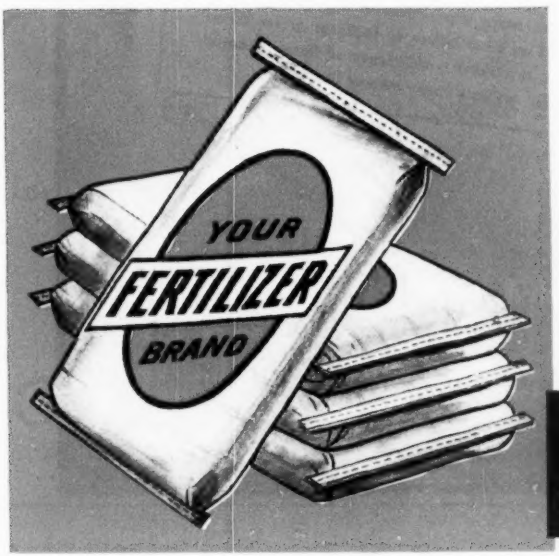
Vernon Mount

THANKSGIVING

Here's a Thanksgiving toast to all the many friends of Raymond Multi-Wall Paper Shipping Sacks.

North, south, east, or west, wherever you are and whatever you're doing, won't you pause with us and give thanks for being Americans and for loving America, the land of prosperity, happy homes, and happy people.

Pack Your Fertilizers in CUSTOM BUILT Raymond Multi-Wall Paper Shipping Sacks



. . . the fertilizer shipping sacks that are made-to-order for packers, shippers, and producers of commercial fertilizers. Made in various sizes, types, and strengths . . . printed or plain . . . there is a Raymond Shipping Sack ideally suited to every packing requirement. They're sift-proof, dust-proof, and water-resistant.

Give your old brands a new look with Raymond. Introduce your new products in a Quality Raymond Shipping Sack. They cost no more than other quality containers.

THE RAYMOND BAG COMPANY
Middletown, Ohio

RAYMOND
MULTI-WALL
PAPER SHIPPING SACKS

POTASH
TRONA
SALTS

Trona
Muriate of Potash

This vitally important ingredient of mixed fertilizer provides the soil nutrient necessary to resist plant diseases and to enhance the productivity of crops. To obtain the best results, specify "Trona" Muriate of Potash . . . made by the pioneer producers in America.

Three Elephant
Agricultural Pentahydrate
Borax

Contains a minimum of 44% B_2O_3 or approximately 121% equivalent Borax. More economical in this concentrated form when used as an addition to fertilizer or for direct application to the soil, to correct a deficiency of Boron. Consult your local County Agent or State Experimental Station.

AMERICAN POTASH & CHEMICAL CORPORATION

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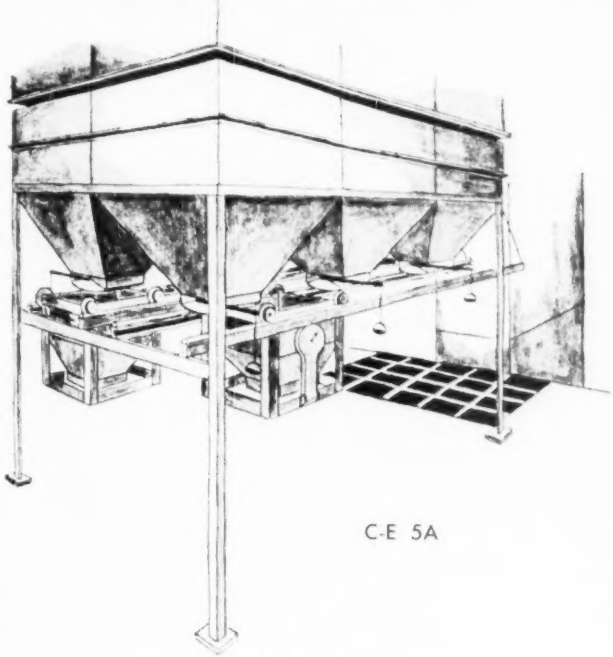
214 WALTON BUILDING
ATLANTA 3, GEORGIA

3030 WEST SIXTH STREET
LOS ANGELES 54, CALIF.

YOU can do what Buhner DID!



C-E 5A

BUHNER FERTILIZER CO.
Danville, Illinois

SAVED 60c A TON!
from previous costs,

THE FIRST NIGHT
of operation of his C-E System.

WITH AN INEXPERIENCED CREW!

And Averaged 45 Tons per hour. 9 tons per man per hour! We have always promised you C-E Hopper systems will pay for themselves, and from the start!

Buhner Fertilizer Co. operates the C-E Model 5A Illustrated here.

Electrically Driven! Simple 2-Man Weighing!
No Shovels! No Carts! Less Labor!
Low Investment, Low Cost, Greater Accuracy and Easier on the Men!

THIS C-E SYSTEM

COSTS LESS THAN $10,000, f. o. b. GREENBAY, WISCONSIN

Our Book "The Picture Has Changed" is Free, Write For It!

Chemical Engineering Service, Inc.

GREEN BAY, WISCONSIN

KEEP IT MOVING . . . PHILLIPS 66 AMMONIUM SULFATE!

To prevent shortages, fertilizer "pipe lines" should be kept filled all the way to the farmer's land!

Farmer . . . retailer . . . mixer . . . and manufacturer . . . we all know that early purchases help prevent future shortages. By maintaining adequate supplies all along the line, from factory to farm, we can help avert shortages of fertilizer.

READY FOR DIRECT APPLICATION

Phillips *66* Ammonium Sulfate has a high nitrogen content—is ready for direct application. This high quality product has fine physical characteristics. Its large crystals resist caking . . . flow freely . . . drill efficiently.

You can get tonnage quantities of Phillips *66* Ammonium Sulfate now. Available for shipment in bags or bulk.

Contact our nearest district office for full information today.

NITROGEN 21%

Phillips 66

PHILLIPS CHEMICAL COMPANY

A Subsidiary of Phillips Petroleum Company

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Ad No. 3666

the call for
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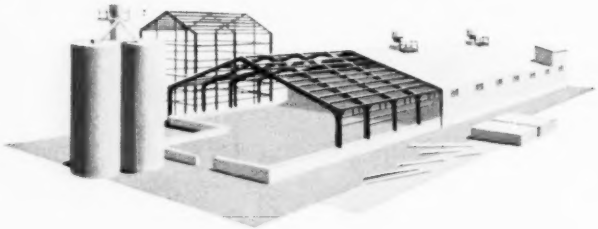
is the call for
FULTON
Fulton is now a recognized factor in the manufacture of quality Multiwall Paper Bags. Orders received from the largest users in many industries have been executed to the complete satisfaction of the buyers.
We are very proud of the confidence shown in our company by those who have favored us with orders for bags. We will spare no effort to continue producing the kind of bags that will keep these names on our books for many years to come.
Our new modern plant in New Orleans is equipped to produce all types of Multiwall Paper Bags. Give us a call on your next order.
Fulton BAG & COTTON MILLS
Atlanta • St. Louis • Dallas • Kansas City, Kans.
Denver • Minneapolis • New Orleans
Los Angeles • New York City
FULTON MAKES YOUR STYLE MULTIWALL PAPER BAG:
SEWN VALVE WITH TUCK-IN SLEEVE . . . SEWN VALVE . . . SEWN VALVE WITH L.C. SLEEVE . . .
PASTED VALVE . . . PASTED OPEN-MOUTH . . . SEWN OPEN-MOUTH



McCloskey Buildings are Ideal For Your Fertilizer Plant

Your plant is housed efficiently at low cost in a McCloskey Building because the exclusive Rigidsteel* design is ideally suited to fertilizer plant operation. The heavy beam sections provide great ruggedness and extra resistance to corrosion. The extra headroom you get by elimination of outmoded trusses gives ample space for overhead conveyor systems without increasing the height of your building.

You benefit by McCloskey's experience in building fertilizer plants for others when you specify McCloskey Buildings. For information write McCloskey Company of Pittsburgh, 3412 Liberty Avenue, Pittsburgh 1, Pa.

**Rigidsteel is the trademark of the McCloskey Company of Pittsburgh*

McCloskey Company
of Pittsburgh

EMPHASIS ON QUALITY

Backed by over eighty-five years of chemical experience, the AA QUALITY Seal stands for highest quality and uniformity. Factory locations in or near principal consuming markets assure prompt, dependable service for the complete line of products, listed below.

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AGRICO®—The Nation's Leading Fertilizer
AA QUALITY® Fertilizers
18% NORMAL® Superphosphate
SUPERPHOSPHATE
PHOSPHATE ROCK—Florida Land Pebble
AGRINITE®—the organic Plant Food
AA QUALITY® Ground Phosphate Rock

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CALCIUM ARSENATE
BORDEAUX MIXTURE
DEROX 0.75% Rotenone
NICOTINE PYROX®—garden spray
PYROX®—with Arsenical—no nicotine
POTATO POWDER No. 1
PHOSPHODUST®—Diluent for dusts

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PHOS-FEED®—Calcium Phosphate Mineral Mixture

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PHOSPHORUS RED (Amorphous)
PHOSPHORUS PENTASULPHIDE
PHOSPHORUS SESQUISULPHIDE
FERRO PHOSPHORUS (Iron Phosphide)
SLAG

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FLUOSILICATE MIXTURE

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BONE BLACK PIGMENT (COSMIC®)
BLACKS
BONE ASH
BONE OIL
PRECIPITATED BONE PHOSPHATE

KEYSTONE® AMMONIUM CARBONATE U.S.P.

SALT CAKE
SULPHURIC ACID

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The AMERICAN AGRICULTURAL CHEMICAL Co.

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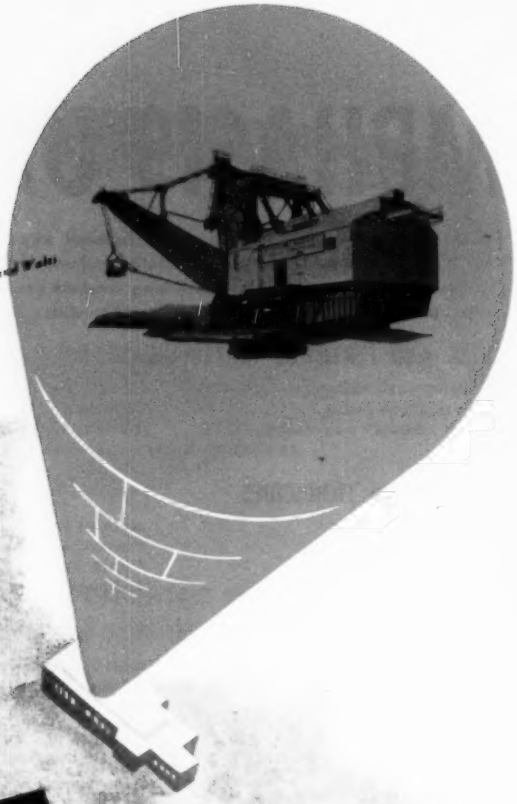
Buffalo, N. Y.
Carteret, N. J.
Charleston, S. C.
Cincinnati, Ohio
Cleveland, Ohio
Clinton, Iowa
Columbia, S. C.
Detroit, Mich.
Greensboro, N. C.
Havana, Cuba
Henderson, N. C.
Houlton, Me.
Laurel, Miss.
Montgomery, Ala.
Montreal, Quebec, Can.
National Stockyards, Ill.
New York, N. Y.
Norfolk, Va.
No. Weymouth, Mass.
Pensacola, Fla.
Pierce, Fla.
Port Hope, Ont., Can.
Savannah, Ga.
Spartanburg, S. C.

Mines and Plants in Florida at Noralyn
Peace Valley, Achan, Mulberry; in Tennessee at Mt. Pleasant and Wales



Large Production
International
phosphates

Florida Pebble Phosphate
ALL COMMERCIAL GRADES
Tennessee Phosphate

PHOSPHATE DIVISION

INTERNATIONAL MINERALS
& CHEMICAL CORPORATION

General Offices: 20 North Wacker Drive, Chicago 6

Norris E. Dodd, director-general of the Food and Agriculture Organization of the United Nations, who will be one of the speakers at the National Fertilizer Association's fall meeting at Edgewater Park, November 13-15.

Outstanding Speakers To Address NFA's Meeting At Edgewater Park

For the first time in its long history, NFA will hold its Fall Meeting in the Gulf-State area. The gathering will be held at the Edgewater Gulf Hotel, Edgewater Park, Mississippi, November 13-15. Topics relating to the future of American agriculture will be discussed by business, agricultural and government leaders.

Among the speakers will be Norris E. Dodd, director-general of the Food and Agriculture Organization of the United Nations, and Robert Lee Humber, prominent attorney of Greenville, North Carolina. J. E. Totman, president, Summers Fertilizer Company, Baltimore, Md., and Chairman of the Board of the Association, will also address the gathering.

A special feature of the meeting will be a panel on the pros and cons of high analysis fertilizers with J. F. Fudge, state chemist, College Station, Texas, as moderator. Maurice H. Lockwood, vice president, Plant Food Division, International Minerals & Chemical Corporation, Chicago; and A. F. Miller, general sales manager, Plant Food Division, Swift & Company, Chicago, will represent the fertilizer industry, while Ivan E. Miles, extension agronomist, State College, Miss., and H. L. Dunton, head, agronomy department, Virginia Polytechnic Institute, Blacksburg, will represent the agricultural colleges.

It Seems to Me

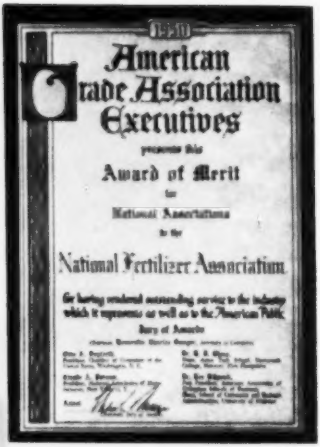
by BRUCE MORAN

In this issue we present for the second time an annual report by the National Fertilizer Association, to the industry it serves so well. The material in the main body of this issue has been prepared entirely in the offices of NFA. Following the program developed last year, we will in January present a similar report from the American Plant Food Council to the industry, and subsequent reports from the regional fertilizer associations.

It seems to me this serves a useful purpose in permitting non-members of these fine associations to realize how much association work is contributing to the welfare of the industry, and in permitting the associations to reach the widest possible audience in the industry, which is the readership of Commercial Fertilizer.

Cotton Insect Conference December 7-8

The fourth annual Cotton Insect Control Conference is scheduled to be held at the Peabody Hotel, Memphis, Dec. 7-8. It will bring together federal and state entomologists and representatives of the insecticide industry, as well as Extension Services, Experiment Stations, farm organizations, land grant colleges and the cotton industry.



Highlights of

NFA Wins Award

Scarcely any step in the history of commercial fertilizer has borne greater promise for the industry or for American agriculture than the announcement of The National Fertilizer Association of its formation of the NFA Plant Food Educational and Research Foundation. First made public by President Russell Coleman at the 25th annual meeting of the Association last June, the Foundation is now being organized and plans are being considered for the initial work to be undertaken.

In this Foundation, industry members are offered the opportunity to engage in a comprehensive program for securing and disseminating information on the proper utilization of plant food, either as separate materials or as fertilizer mixtures, in order that the plant-food elements lost from our Nation's soils may be restored, that our agricultural production may be made more efficient, and that the fertilizer industry may be placed in a better position to produce and distribute the most economical and beneficial fertilizers for our Nation's economy. This Foundation is a development and expansion of NFA's Plant Food Research Committee.

Just what problems will first be accepted for attack by the Foundation has not yet been decided but numerous opportunities exist, such as determining the potential fertilizer market in various regions of our Nation, determining the fertilizer practices currently followed by farmers, enlarging the study of methods of fertilizer distribution, devising additional ways and means of disseminating to the farmer data and current information on proper fertilizer usage, working out more effective educational programs for developing potential fertilizer markets, and cooperating, in a wider field of endeavor, with the land grant colleges and extension services.

That the Association is particularly well equipped to carry on the public relations program which must be a part and parcel of the activities of this Foundation has long been demonstrated. At the 31st annual convention of the American Trade Association Executives, held in Boston, September 27, the NFA was singled out for an Award of Merit "for its excellent services to its industry and to the public" during 1949-50. The Jury of Awards, of which Secretary of Commerce Charles Sawyer was chairman, cited the Association "especially for its long-range program of research, education and trade promotion."

THE AWARD-WINNING PROGRAM

The objectives, methods and results of the Association's work during the past 12 months have been prepared in outline form to accompany an exhibit recently presented to the American Public Relations Association. COMMERCIAL FERTILIZER takes pleasure in publishing for the first time the following text of this outline.

Promoting Sound Agriculture Through Fertilizer Use

Each year some 10 million tons of the principal plant foods—nitrogen, phosphoric acid and potash—are removed from America's soils in the harvesting of crops and another 40 million tons are lost through erosion and leaching. The amounts returned to the soil as commercial fertilizers, manures and crop residues total less than 10 million tons.

OBJECTIVES

1. Long-Term Objective. The comprehensive and continuing objective of The National Fertilizer Association during the many years of its public service has been to narrow this wide gap between removal and replacement of plant food—to reduce the huge annual overdraft on our plant food bank account—through proper and adequate use of fertilizer on our Nation's farms. In addition to playing a large part in conserving our soils for future generations such use promotes sound agriculture in its broadest sense.

Without fertilizer, enormous additional amounts of land and labor would be required to meet the vast agricultural needs of our growing population. Fertilizer today accounts for at least 20 percent of all U. S. farm production.

Even if we could somehow produce enough to meet our needs without fertilizer—and it is extremely doubtful that we could—the added annual cost of our food and clothing requirements would run into billions.

NFA Activities

The use of fertilizers, by increasing per-acre yields, promotes greater farm efficiency, hence good returns to farmers and general economic prosperity.

2. Short-Term Objective. The year 1950 marks the 100th anniversary of the founding of America's fertilizer industry. NFA and its more than 400 member companies are observing the occasion by calling special attention to the contributions of fertilizer and of the fertilizer industry to our economic welfare and national security. Widespread recognition of these contributions serves two purposes: First, by encouraging increased fertilizer use, it broadens the area receiving fertilizer's benefits; second, by building a stable demand for fertilizer, it favors the continued and healthy growth of a vital industry.

The experiences of World Wars I and II provide abundant evidence that in order to win a war, a nation must find ways to produce greater supplies of food and fibre with a smaller labor force. The strategic value of fertilizer in accomplishing such a job was convincingly demonstrated between 1939 and 1944; in the latter year, with seven percent fewer workers, our farms used 48 percent more fertilizer and turned out 28 percent more products than in 1939.

The present tense international situation again calls for greater production of necessary commodities and more efficient utilization of our resources, especially manpower. In such a situation, the value of fertilizer is well recognized, its job clearly defined. But to do its job fully and to be of maximum value, farmers everywhere must be made aware of fertilizer's capabilities. By fostering such an awareness, NFA feels that it is contributing substantially to the strength and security of our Nation.

I. POSTING THE PUBLIC METHODS

1. Your Future's In The Bag. This pamphlet, graphically summarizing fertilizer's place in our national economy, has been distributed to tens of thousands of readers.

RESULTS

Enthusiastic public reception—a few of the 500 comments:

"Beautifully done and the most graphic presentation of the progress of the industry I have ever seen."—Berry H. Akers Editor, **The Farmer.**

"The whole format in conception and execution is tops."—Paul L. Schwartz, industrial relations, **The California Dairyman.**

THESE ARE THE MEN WHO GUIDE THE DESTINIES OF NFA

Chairman of the Board:
J. E. Totman
Summers Fertilizer Company, Inc.
Baltimore, Maryland
Vice-Chairman of the Board:
Louis Ware
International Minerals & Chemical Corp.
Chicago, Illinois
President: Russell Coleman

Members of the Board

T. W. Allen, Sand Mountain Fertilizer Co., Attalla, Ala.;

F. N. Bridgers, Farmers Cotton Oil Co., Wilson, North Carolina;

L. Graham Campbell, Chamberlin & Barclay, Inc., Cranbury, New Jersey; Elbert N. Carvel, Valliant Fertilizer Co., Laurel, Delaware; Moultrie J. Clement, Merchants Fertilizer & Phosphate Co., Pensacola, Florida;

James W. Dean, Knoxville Fertilizer Co., Knoxville, Tennessee;

J. H. Epting, The Epting Distributing Co., Leesville, South Carolina;

B. B. Fall, The Rogers & Hubbard Co., Portland, Connecticut; M. G. Field, Meridian Fertilizer Factory, Hattiesburg, Mississippi; Ralph E. Fraser, Summers Fertilizer Co., Bangor, Maine; H. B. Fultz Hector Supply Co., Miami, Florida;

E. A. Geoghegan, The Southern Cotton Oil Co., New Orleans, Louisiana.

L. D. Hand, Pelham Phosphate Co., Pelham, Georgia; E. B. Helgeson, Magnolia Fertilizer Co., Seattle, Washington; M. S. Hodgson, Empire State Chemical Co., Athens Georgia;

R. L. King, Georgia Fertilizer Co., Valdosta, Georgia;

Maurice H. Lockwood, International Minerals & Chemical Corp., Chicago, Illinois; W. Newton Long, Miller Chemical & Fertilizer Corp., Baltimore, Maryland;

R. D. Martenet, E. Rauh & Sons Fertilizer Co., Indianapolis, Indiana; C. R. Martin, The Miami Fertilizer Co., Trebein, Xenia, Ohio; Walter E. Meeken, Consolidated Rendering Co., Boston, Massachusetts; John A. Miller, Price Chemical Co., Inc., Louisville, Kentucky;

J. L. Nichols, Sumter Fertilizer Mfg. Co., Sumter, South Carolina; Weller Noble, Pacific Guano Co., Berkeley, California; J. E. Nunnally, The Cotton Producers Association, Atlanta, Georgia;

J. H. Owens, Roanoke Guano Co., Roanoke, Alabama;

John E. Powell, The Smith Agricultural Chemical Co., Columbus, Ohio; C. T. Prindeville, Swift & Co., Chicago, Illinois;

E. S. Russell, Old Deerfield Fertilizer Co., South Deerfield, Massachusetts;

A. A. Schultz, Reading Bone Fertilizer Co., Reading, Pennsylvania; C. D. Shallenberger, Shreveport Fertilizer Works, Shreveport, Louisiana;

J. E. Totman, Summers Fertilizer Co., Inc., Baltimore, Maryland;

Louis Ware, International Minerals & Chemical Corp., Chicago, Illinois; A. W. Weaver, Weaver Fertilizer Co., Inc., Norfolk, Virginia.

Totman

Coleman

"Most comprehensive treatment of the fertilizer industry . . . instructive and most artistic."—Arch S. Merrifield, Editor, **Farm Equipment Retailing.**

"An excellent presentation."—E. W. McMunn, Editor, **Ohio Farmer.**

"Tells a convincing story in a most effective manner."—F. W. Parker, Assistant Chief of Bureau of Plant Industry, Soils and Agricultural Engineering, U. S. Department of Agriculture.

"The slogan 'Your Future's in the Bag' certainly matches 'Say It with Flowers.'"—Richard P. White, Executive Secretary, American Association of Nurserymen.

"The most readable and enjoyable booklet I have read in a long time."—H. B. Cheney, Extension Agronomist, Iowa State College of Agriculture.

"An excellent graphic portrayal of the need for fertilizer in American agriculture."—O. B. Price, General Agricultural and Livestock agent, New York Central System.

METHODS

2. A Century of Progress with Fertilizers, a colorful pamphlet, has been specially designed to acquaint the American public with the achievements of the fertilizer industry during the first hundred years of its service. Each of the 11 articles is the work of an outstanding figure in American life.

RESULTS

A welcome from all parts of the Nation. Sample comments:

"Your brochure is very attractively presented."—Hon Leverett Saltonstall, U. S. Senator from Mass.

"You and your efficient staff are to be congratulated on not only the publication but also for your part in working so closely with the agricultural agencies as well as industry. Your work has in no small way accounted for this progress."—B. D. Cloaninger, head, Department of Fertilizer Inspection and Analysis, The Clemson Agricultural College.

"I should like to extend to you and your staff my congratulations on such an informative and interesting booklet. You are to be commended for the good work you are doing in the field of agriculture."—Ralph B. Draughon, president, Alabama Polytechnic Institute.

"We want to congratulate you and The National Fertilizer Association on celebrating the 100th anniversary of the fertilizer industry."—M. P. Etheredge, state chemist, Mississippi State Chemical Laboratory.

". . . most interesting and I appreciate receiving it."—Hon. Tom Linder, Commissioner of Agriculture, Georgia.

"An excellent booklet—very nicely prepared."—T. B. Symons, dean and director, extension work, State of Maryland.

METHODS

3. Fertilizer Review, a quarterly, is distributed to 32,000 agricultural, business and government leaders. Its general purpose: To advance agriculture through an enlarged and judicious use of fertilizers. During 1950 considerable space has been given to articles recounting the industry's achievements during its 100 years of service.

RESULTS

Recognition as the outstanding journal in its field. Other journals frequently republished its articles. Here are readers' comments recently received:

"The **Review** is a valuable addition to the Technology Department's collection and is often used."—Daniel R. Pfoutz, head, Technology Department, Toledo Public Library, Toledo, Ohio.

"The **Fertilizer Review** is quite useful to many of our members."—W. A. Hamor, assistant director, Mellon Institute of Industrial Research, University of Pittsburgh, Pittsburgh, Pa.

"We certainly appreciate the **Review.** It is thoroughly read by every one in the organization."—B. T. Christensen, chief chemist, Emergency Export Corp., Wahoo, Nebraska.

"I appreciate receiving the **Review** and treasure it for its information."—W. G. Merritt, Sec'y.-Inspector, State Milk Commission, Roanoke, Va.

"I first received the **Review** when I was in college and have been farming for 17 years."—Granville Haines, Mount Holly, N. J.

"We appreciate receiving this valuable journal very much indeed."—W. R. Lukie, Supt., Experimental Station, Morden, Manitoba, Canada.

"I use articles and information from the **Review** almost daily in my work."—Roy Erwin, Guthrie, Okla.

"A very fine publication."—Clarence D. Vaughn, Vaunlanda Gardens Nursery, Woodland, Calif.

"Your **Fertilizer Review** is extremely worthwhile to me in my work."—George V. Gaines, Man-

ager, Farm Development Department, The Citizen's and Southern National Bank, Atlanta, Ga.

METHODS

4. Working Through the Press. The NFA staff keeps in constant touch with general, agricultural and trade publications and radio stations throughout America, furnishing them with a steady flow of information relative to fertilizers and cooperating with them in the preparation of articles and in the promotion of special projects.

RESULTS

The success attained in projects undertaken by NFA is typified by the wide coverage given the Association's contribution of a trophy emblematic of victory in the 1949 North Carolina-Virginia corn growing contest. Scarcely a newspaper or magazine in the two States failed to use the mats and story on this affair as distributed by NFA. An exhibit in which the trophy was the center of attention was prepared by NFA and displayed in communities large and small, and captured the interest of those who view it.

The public service rendered by NFA in this connection is indicated by the following message received from Governor William M. Tuck of Virginia: "This friendly rivalry has been highly beneficial to the economy of both States and the contribution of your Association to its success is sincerely appreciated."

And from Paul D. Sanders, Editor of **Southern Planter** and chairman of publicity of the contest: "We appreciate the fine cooperation you are giving us."

II.
INFORMATION FOR FARMERS.

METHODS

1. Efficiency-Promoting Pamphlets. During 1949-50 the Association added several pamphlets to its list of some 400 others prepared during the course of its 50-year history—all dedicated to providing farmers with useful up-to-date information on ways to improve their soils, their yields and their incomes.

RESULTS

A steady growing demand for NFA's literature by farmers everywhere. About 40 million copies have been distributed through the Association during its 50 years.

2. Hunger Signs In Crops. This book, a copy of which accompanies NFA's entry as an exhibit, fills a need for an authoritative and comprehensive study of plant-food deficiencies in soils and crops. Edited and distributed by NFA and sponsored jointly by NFA and the American Society of Agronomy, this study was completely revised in 1949. Three printings of the revised edition have been needed to fill the demand.

Hunger Signs In Crops is used as a textbook and reference work in many schools and colleges. Tens of thousands of copies have been sold. Of the book Louis Bromfield says: "The finest in its field . . . it is absolutely basic in relation to agriculture—to prosperous agriculture and to good soil."

METHODS

3. Slide Libraries. The NFA maintains two comprehensive Kodachrome slide libraries—one of plant-food deficiency symptoms in crops, the other fertilizer distributing machines.

Continued on page 42)

TWO GREAT NFA GATHERINGS

FALL MEETING 1949

Place—Atlanta, Georgia—November 14-15

Guest Speakers

F. W. Parker, Assistant Chief, Bureau of Plant Industry, Soils and Agricultural Engineering, USDA

W. F. Watkins, Chief, Fertilizer, Seeds and Pesticides Branch, ECA

John Higson Smith, Leader of United Kingdom Fertilizer Team

W. R. Thompson, associate leader, Extension Agronomy, Mississippi State College

John L. Liles, Jr., agricultural economist, Federal Reserve Bank of Atlanta

CENTENNIAL CONVENTION – 1950

Place—White Sulphur Springs, W. Va.—June 12-14

Ralph Robey, Chief Economist National Association of Manufacturers

Robert M. Salter, Chief of USDA's Bureau of Plant Industry, Soils and Agricultural Engineering

Hon. Allen J. Ellender
Senator from Louisiana

Paul D. Sanders, editor
Southern Planter

SPECIAL FEATURES

Panel "Telling the Soil Improvement Story." Participants: Leading journalists and scientists.

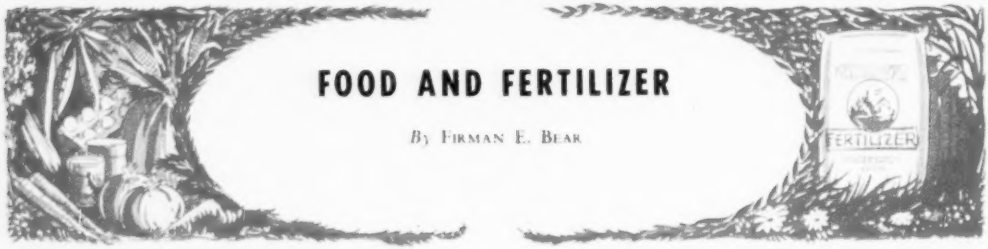
NFA Movie: "New England's Green Pastures."

J. E. Totman and Louis Ware elected as chairman and vice chairman, respectively, of Board of Directors.

Plant Food Research Committee Panels: "A Century of Progress in Compounding and Utilizing Fertilizers" and "The Fertilizer Industry and Grassland Farming."

Special Industry Exhibits.

HIGHLIGHTS OF NFA ACTIVITIES



FOOD AND FERTILIZER

By Firman E. Bear

The fertilizer industry represents the most important advance ever made toward providing plenty of food for the peoples of the earth. By the use of fertilizers, it is possible to bring the most barren ground into production, to maintain the productivity of fertile soils, and to raise the crop-producing capacities of all soils to higher levels. Without their use, the problem of adequately meeting the food needs of the world's two billion people is essentially insolvable.

The raw materials that go into the production of fertilizer had their origin largely in the rock that once made up the surface of the earth. As the rock underwent the action of the elements over the ages it lost a large part of its substance to the sea. It is the job of the fertilizer and the agricultural lime industries to return these leached-out materials to the land from which they came. The fertilizer industry, in addition, collects nitrogen from the inexhaustible supply in air and combines it with other elements so it can be used on the soil.

The earth came into existence some two billion years ago. A billion years passed before even the simplest forms of life came into being, and it took another 700 million years for flowering plants to evolve. The primitive forms of man did not arrive on the scene until a mere million years ago.

During the two billion years of the earth's existence, gigantic forces were at work tearing the rock to pieces, leaching out the soluble salts, carrying them out to sea, and laying down large deposits of them on the bottom of the oceans. In addition, atmospheric nitrogen was being combined with carbon, hydrogen and oxygen on a tremendous scale to form organic matter.

Much of what took place during this long expanse of time might appear to have been extremely wasteful. But there was method in Nature's madness. The salts in the sea were not wasted. They merely awaited the hand of God and man.

In due time, large deposits of these rock-derived materials were shoved up out of the ocean, and they are now being put back on the land from which they came. Among them are many billions of tons of phosphate rock, potash salts, nitrate of soda, limestone, sulfur and borax.

Everything on the earth, in the sea, and in the air above us has been placed at man's disposal. He has been endowned with a brain with which to think. Out of such thinking has grown an enormous chemical industry. The fertilizer and lime producers constitute a highly important part of this industry. During 1949, some 45 million tons of material were processed for use on the land in the United States alone. The necessary raw products were gathered from ancient seas, from the deserts, and from the air. And, when these products had been properly processed and applied to the land, the results on the crops were nothing less than phenomenal. Poor land was made good, good land was made better, and even the best land responded to their magic touch.

At the Rothamstead Experiment station in England, there is a plot of land that has received nearly 1400 pounds of fertilizer per acre every year for more than a century. That land has been sown to wheat continuously, and the yield of grain has been maintained at about 34 bushels per acre during this entire

period. The yield on nearby unfertilized land averaged about 12 bushels per acre, or only a little over one third as much.

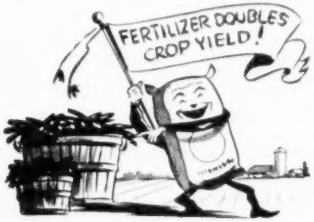
At the Pennsylvania Agricultural Experiment Station, there is an area of land on which tests of fertilizers have been under way for 68 years. In this case, wheat is being grown in rotation with clover, corn and oats. Fertilizer is applied at the rate of 350 pounds per acre annually, and the yield has averaged a little over 23 bushels per acre.* Where no fertilizer was used, the yield was a little over 12 bushels

* Records for the first 44 years only are available at this writing.

per acre. Thus, even under a good crop-rotation program, the yield was nearly doubled by the use of a few hundred pounds of fertilizer.

At the Ohio Agricultural Experiment Station, wheat was grown in rotation with clover and corn under a soil-management system in which eight tons of manure were applied every three years in preparation for corn. Forty pounds of superphosphate were scattered over each ton of manure before it was applied to the land. The yield of wheat on this land, over a 26-year period, averaged 29 bushels per acre. On nearby land, where no superphosphate was added to the manure, the yield was 24 bushels. Thus the use of superphosphate at the rate of a little over 100 pounds per acre per year added nearly 5 bushels of wheat to the acre yield, and corresponding yield increases were added to the other two crops in the rotation.

This quick look at the effect of fertilizers on wheat shows that yields can be raised to much higher levels, no matter whether the wheat is growing continuously or in rotation with clover and no matter whether the land has been manured or not. And what applies to wheat, applies to all other crops as well. The yields can often be doubled by the use of fertilizers. In the more



extreme cases, complete crop failures can be changed to high acre yields of high quality crops merely by using fertilizers of the right kind in the right way. But even under the best systems of soil management, including rotation with legume crops and the use of manure, an extra boost of highly profitable proportions can be added by the use of fertilizers.

Why are these chemicals so effective? Merely because they add to the supply of essential plant-nutrient elements in the soil. This was one of the earliest discoveries of the agricultural chemists who began work on this problem about 150 years ago. These chemists analyzed plants, the gases that escaped when they were burned, and the ash remained. They analyzed the soils on which the plants had been grown, the manure that was applied to the land, the water that carried the necessary elements into the plants from the soil, and the air that was above and in the soil. Out of the facts assembled by these procedures, a complete picture was formulated of what plants require. It was shown that in proportion as any given soil was low or lacking in any given essential element more of that element could be added to advantage. Out of these findings grew the fertilizer industry.

That is what one should expect. The most fertile lands on earth are the irrigated deserts. All that is needed in the desert to produce luxuriant yields of the finest quality food crops is to supply the missing water. Irrigated desert lands contain all the elements of fertility in abundance. All they need to become highly productive is that water be added through which these elements can move into the plant. Such land can be farmed for a half century before any very serious reduction in yield takes place. In due time, of course, extra nitrogen and phosphorus have to be applied and, after a century or so, some of the other fertility elements as well. In general, however, irrigated-desert soils are highly productive because the salts that have been dissolved out of the rocks from which they were derived were not carried away by heavy rains. These salts are the same kind as those that are hauled back and put on the land as fertilizers in the humid areas of this country.

Some of the most productive land on earth has been reclaimed from the ocean. A notable example of such reclamation is found in Holland. There a dike was built across an arm of the sea, the ocean water was pumped out, and the soil was gradually brought under cultivation. The yields on this land are exceptionally high, merely because the soil is saturated with sea salts. And the quality of these crops, like that of the crops grown on the irrigated arid areas of the earth, has never been questioned.

It has long been known that the physical properties of soils are equally as important as their chemical makeup in determining their productivity. In some areas, no special physical problem is involved because the soils are made up of almost ideal proportions of sand, silt and clay. But, for most soil, two important procedures are essential if it is to be maintained in good physical state. It must be well supplied with organic matter, and, following each period of cultivation, it must be given time to undergo a healing process.

There is no substitute for organic matter. When worked over by soil microbes, built into the structure of the fungi that grow through the soil, and reduced to the colloidal state, it becomes an intimate part of the soil. And, when this has been done, the soil takes on highly improved physical properties as a result of which it becomes much more favorable for the growth of plant roots. But continued cultivation results in rapid loss of soil-organic

(Continued on page 46)

Dr. Bear, chairman, Soils Department, Rutgers University, New Jersey Agricultural Experiment Station, is one of the outstanding scientists in America today and is editor of SOIL SCIENCE. He recently served as president of the American Society of Agronomy.

The World Can Feed Itself

By Louis Bromfield

As a Nation we inherited the richest area of its size on the face of the earth. As a people we have exploited, and in some sense destroyed, the national resources of this great rich area, and we have done so more rapidly than the people of any nation at any time in the history of the world. Very fortunately, we are learning our lesson, I think, before it is too late. We are beginning to appraise and conserve our national resources in all forms, such as oil, iron and copper, forests, water and soil.

I am thinking particularly of agriculture today in relation to soil and its productivity—what it can produce.

In the agricultural history of America, we have been through two phases and are now in the third. In the first phase our farmers had almost unlimited virgin land of immense fertility, and that phase went on for three, four or five generations, according to the age of the country settled. It cost us, in our time, billions of dollars, with an agriculture which was perhaps ignorant, perhaps greedy, but which was content to live on what Nature had laid down over the course of a million years, and to exhaust it through continued bad farming and erosion.

The second phase might be called the chemical fertilizer phase, and in many respects it was just as destructive, because there grew up a school of thought which believed and taught that it was possible to farm with NPK commercial fertilizer alone and to proceed from there on out without any trouble. At Malabar Farm we inherited land which had been treated that way and I should know the situation at first hand.

The Malabar Program

We bought farms which were abandoned as the result of the purely chemical fertilizer school of operation, and what we got was soil that could be described only as a financial liability. However, I'll give you a little record of what happened when we went to work on that soil. Using a balanced agriculture, we included the element of moisture, the element of organic materials, and all the other things that go into good farming. On that farm, which when we took it over was half in weeds and was producing less than five bushels to the acre of wheat, we didn't use a combine that first year—we mowed the wheat down. Two years later we took 33 bushels of wheat and four years later we took 53 bushels of wheat off the same land. We used chemical fertilizer to good advantage, but we used the other elements which made it available to the crop.

Now, in order to support my thesis that the world can feed itself, I must point out that, happily, we made more progress in agriculture in this country in the last 15 to 25 years than in the whole history of the world before. I think it is also conservative to say that what we know is less than 10 percent of what there is to be known. Every day there are discoveries of every sort, ranging from chemical reactions to the trace elements and the antibiotic processes, all related to the soil.

In that field the chemical fertilizer plays a very great part—it plays a great part in establishing the proper balances in the soil, to produce healthy plants, animals and people . . . production in terms of nutritional value of high-protein rather than low-protein feed for livestock, a balanced mineral content in the plants themselves, and consequently in the diets of the animals fed.

They are allied—nutrition, quan-

Louis Bromfield's home and farm at Lucas, Ohio

From an address delivered before the 24th annual convention of The National Fertilizer Association at White Sulphur Springs, West Virginia, June 13-15, 1949.

Bromfield

tity and quality, are all equally allied to good productive and paying soil, and when you begin to get full nutritional quality you are also beginning to get sooner or later a finer actual yield of crops.

A Cubic Foot of Soil

A cubic foot of good productive soil is not merely a mixture of minerals. A cubic foot of soil is a community of living organisms in which every law of the Universe is in operation. It contains the major elements, calcium, phosphorus, nitrogen, potash. It contains a balance between organic materials and minerals. It contains a good many minor elements about which we are finding out some pretty wonderful things in relation to the plants themselves and to the animals and people that feed upon the products of the soil. In addition to that there is in a cubic foot of really productive soil an immense amount of life in the form of bacteria and molds and fungi and the antibiotics which they produce, and every sort of tiny animal life up to the earthworm, which is a giant by comparison with others.

Now do not think for a second that I belong to what is called the organic farming group, or that I believe that earthworms are the salvation of the human race. No such thing. It is impossible for this country to do without chemical fertilizer and chemical fertilizer in great quantities.

Agriculture is one of the most complex and complicated of professions, perhaps the most, in the world. We are finding out every day how increasingly complex and complicated it is, because it involves all the laws of chemistry and physics and reaches up into nutrition and health, affecting even our intelligence; it reaches into economics and the very economic foundation of our Nation. It is not a simple business, and the old expression that "anyone can farm" is the most idiotic ever made and incidentally has cost us billions of dollars. To be a good farmer you must have plenty of brains and plenty of knowledge, without question.

But to get back to the cubic foot of living soil. At Malabar we have been working at it for a long time, I have been working at it most of my life, and we are coming fairly well to the conclusion that the laws which govern good agriculture in relation to a given problem or crop are probably as exact as the laws which govern chemistry, physics, mathematics or any of the so-called exact sciences. Our own experience shows there are at least three balances which are pretty exact in their practice and in the results which they give. First of all, there is the balance among the minerals, organic material, and moisture in the soil. The second balance is that among the four major elements, calcium, phosphorus, potash and nitrogen. The third balance is the balance between the first two balances and the whole realm—very remarkable realm—of what is known as the trace elements, that is to say, manganese, magnesium, boron, sulfur, copper, cobalt, and so on.

I might go on and make a whole speech on this subject. All of us know what happens in an area where there is iodine deficiency. I just take that example because it is long established in the realm of medicine.

A New Frontier

It is not enough to make good productive soil out of soil which has been reasonably taken care of and which was basically good soil; we must also, especially in this country, reach out toward what might be called a new frontier. We have

(Continued on page 51)

Photo above by J. C. Allen and Son

Thousands visit Malabar Farm each year

Pasture Programs NEED YOUR ATTENTION

By Malcolm H. McVickar
Chief Agronomist, The National Fertilizer Association

Much more must be done to stimulate pasture work in America. It is high time carefully to review the progress which has been made and consider the opportunities for doing an even better job.

There is much that is encouraging in the picture. Certainly plenty of land is devoted to pasture purposes—more than to all our cultivated crops combined. The figures are impressive. In 1945, the latest year for which statistics are available, there were 529 million acres of pasture land in farms in the United States. Of these acres 420 million were classified as land not plowable and 109 million were designated as plowable. During the same year 77 million acres of hay crops of all kinds were harvested—less than one-sixth of the total farm pasture land. Green acres for feeding livestock are indeed important acres in our agriculture.

Agricultural authorities increasingly are putting their stamp of approval on and are giving their support to the pasture movement. They are stressing that productive pastures provide cheaper nutrients for milk and livestock production than does any other crop. Their evidence is unquestionable. Experiment stations in every State have conducted tests and presented results proving this fact beyond a doubt.

Yes, good pastures can do their job well, providing Nature's most nearly perfect livestock feed at the lowest cost. The story is an old one and has been told many times. Among the most recent studies is one conducted for a 4-year period by the Bureau of Dairy Industry at its Huntly, Montana, field station showing that when all costs were included, pastures produced feed

McVickar

nutrients at a much lower cost than alfalfa hay, grass silage, corn silage, or grains like oats and barley. Grown on good irrigated land the crops produced 100 pounds of total digestable nutrients at the following costs:

Source of Feed	Cost per 100 Pounds Total Digestible Nutrients
Pasture (250 days' grazing)	$0.29
Alfalfa hay (4.7 tons)	.49
Corn silage (13.7 tons)	.91
Grass silage (13.0 tons)	1.17
Oats, grain (66.0 bushels)	1.19
Oats, grain (63.0 bushels)	1.29
Corn silage (9.6 tons)	1.31
Barley, grain (40.0 bushels)	1.40

From many authoritative sources has come undisputed evidence that pasture crops do even more than feed livestock well. It shows that these crops keep the land in good condition and can be relied upon as one of the principal factors in the conservation program in which every farmer—indeed every citizen—should be interested.

We know that there are no real obstacles to the establishment of good pastures in most parts of our agricultural domain. Experiment stations have repeatedly shown that good grasses and legumes can be grown on virtually all of our farms. The recipe for making good pastures has not been selfishly hidden by a few; it has been made available to millions. One of its principal ingredients is fertilizer, the importance of which has been preached in State and Federal agricultural bulletins, in newspapers and radio programs, in pamphlets distributed by such educational organizations as The National Fertilizer Association, in advertisements and in many other ways.

The Cheapest Source of Better Feed

The data on which these statements are based should appeal to the farmer's dollar-consciousness. They show that for each ton of Commercial fertilizer used on pastures for beef cattle the farmer receives an extra thousand pounds of beef, or, in the case of the dairy farmer, an additional 8000 pounds of milk. At today's prices—in fact at prices prevailing throughout the course of our history—the returns from such an investment are most favorable.

Countless progressive farmers recognize that fertilization is the cheapest aid in providing quality feed. For example, the rate of fertilization followed by the competitors in the 1949 Green Pastures Contest in New England was high indeed. The records of the finalists competing in the interstate contest show that these leaders used, on the average, 1100 pounds of a composite 3-16-8.6 grade fertilizer for

FARM PORTRAIT NO. 11

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Any farm boy is, indeed, fortunate if he turns his attention early to those fundamental things upon which a successful farm life rests.

It may be some years before *this* particular young gentleman realizes it, but among such fundamentals must be included a realization of the importance of the wise use of suitable fertilizers. Many of these are compounded with potash—often with Sunshine State Potash, a product of New Mexico, and an outstanding soil nutrient that protects crops against plant diseases and droughts, and provides greater soil fertility.

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each animal unit, or 480 pounds on every acre producing feed. These farmers had an average of only 2.26 feed-producing acres per animal unit, which in itself indicates efficient production methods. If such a rate of fertilization were practiced only on the plowable pasture land of our country we would be using more fertilizer on this small part of our total pasture than was applied on all our crops last year. Yet all of us would agree that such an amount could be used profitably on pastures.

More Intensive Program Needed

Despite all the progress that has been made, the situation with regard to pasture work now carried on in our country calls for redoubled efforts. It is true that many farmers are giving adequate attention to their pastures. On the other hand, many are letting the pastures take care of themselves—admittedly a most inefficient procedure and one not in the best interests of a permanent and sustaining agriculture. Furthermore, many farmers are not utilizing pastures to the best advantage. Not only do they give little or no care to their pastures, but also they use for such purposes only that land which has been taken out of cultivation and which is considered too poor to grow crops. Little wonder we have so many poor pastures.

Equally alarming is the situation with regard to the use of fertilizer. Even though more of our land is in pasture than in all other crops combined, only about 5 percent of the fertilizer used in 1945 was applied to pasture crops.

But let us not be discouraged. The pasture movement is in its infancy, but we are on the right road. As is true of most such efforts, the tangible results are fragmentary in the beginning and it is only considerably later that they start to assume real proportions. It should be remembered that education is a long-time process and must be carried on not only with hard work but also with patience.

Photo by Soil Conservation Service
Good pasture management brings returns in healthy cattle and nutritious milk.

Ladino clover pasture. Land on the right was treated with lime and superphosphate. Land on left was untreated.

Bring the Story to the Farmer

Let's continue with even greater zeal the work we are doing. The following suggestions are made to promote such a program:

1. Demonstrations should be increased by both public and private agencies so that more farmers can see with their own eyes how satisfactory are the returns from well managed pastures. As a result they will be more and more inclined to become disciples of the movement.

2. Some authorities believe that demonstrations should involve several acres so that the farmer will

(Continued on page 53)

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- **Lion Ammonium Nitrate Fertilizer** . . . The improved spherical white pellets in this product contain a guaranteed minimum of 33.5% nitrogen. They flow freely, resist caking and store much better. Lion Ammonium Nitrate Fertilizer is shipped in 100-pound, 6-ply bags with two moisture-proof asphalt layers.
- **Lion Sulphate of Ammonia** . . . This new, superior-type sulphate is guaranteed to contain a minimum of 21% nitrogen. Through special conditioning of the larger crystals, moisture and free acid content is greatly reduced. These factors, together with the special coating applied, make for greater resistance to caking in shipment or in storage. This product flows freely. It is shipped in bulk and in 100-pound, 5-ply bags laminated with asphalt.

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HIGHLIGHTS OF NFA ACTIVITIES

FERTILIZERS IN *Far Western Agriculture*

By M. E. McCollam

A recognized authority tells a graphic story of fertilizer use in the Far West and frankly presents the various problems and prospects.

The Far West is thought of by Easterners as all of the United States west of the Rocky Mountains, but most Westerners would define it as the tier of States along the Pacific slope. Any way you look at it, the area is a vast one in distances, in agricultural land, in mountains, and in desert. Great areas are dry-farmed, and irrigation agriculture is practiced over millions of acres by means of gravity water systems or pumping from wells. Even in the humid areas of the Northwest, supplemental irrigation is now an extensive and effective development.

The greatest part of our agriculture has been on a grand scale, with plenty of land and plenty of water, and, we thought, plenty of plant food in the soil to last thousands of years. Fifty years ago, we had heard about chemicals and organic wastes being used to increase yields in other parts of the world, but on our "rich" soils it was not a popular idea, to say the least. Those who promoted the use of commercial fertilizers were thought to be misguided and a little on the "shady side." For many years there was a general indifference to any problem of soil fertility or plant nutrition in far western agriculture.

Work of Hilgard

The mounmental work of Hilgard in the field of soil research during the early years at the University of California served to call attention to soil fertility problems and to establish wide-spread nitrogen deficiency and a general lack of organic matter as characteristics of soils of arid regions.

In California, the only far-western State which has a record of fertilizer tonnage for a long period of years, 9000 tons were used in 1904. The tonnage did not pass the 100,000 ton mark until 1927. Nevertheless, this small fertilizer industry kept plugging such possibilities as higher yields per acre, better quality, and keeping soils productive through the use of fertilizers. During the thirties the combination of persistence on the part of the industry and development of a greater volume of soil fertility and plant nutrition information on the part of the experiment stations laid the foundation for the greatly increased tonnage of fertilizer used in the decade just passed.

For 1949, tonnage of fertilizers used in California was estimated at about 510,000 tons. The currently used tonnage of agricultural minerals is about 450,000 tons, of which 80 percent is gypsum. Other States in the Far West have shown substantial tonnage increases, also. Washington is currently using around 90,000 tons of fertilizer, Oregon 70,000 tons, and Arizona 45,000 tons.

Factors Deterring Use

Many factors have operated to hold back the use of fertilizers in the West. Most of the factors are common to all sections of the country, but, being a young area, agriculturally speaking, the West is still

Acreage-wise the bean crop occupies a high place and some day may be a big fertilizer user.

Mr. McCollam is manager, Western States, for American Potash Institute, Inc., and chairman, Soil Improvement Committee, California Fertilizer Association.

feeling their pull against upswings in fertilizer tonnage. We still have in the West great areas of some of the most fertile soils in the world. They were formed under arid or semi-arid climatic conditions and are unleached. When irrigation water is applied to these soils, tremendous things happen in the way of crop yields. We are still mining the fertility of these soils for all we can get out of them. As long as we can still take gold out of the mine, the use of fertilizers and the conservation of plant food resources in the soil is not likely to impress those who favor this type of ranching. This factor is being minimized now, however, by these situations. Much land that is not so fertile is being cropped. As some of our lands apparently wear out, it is not so easy or convenient to move over to another section of virgin soil. The attention of our large tree fruit centers is being focused on maintaining soil fertility because orchard plantings are quite permanent and occupy the land year after year.

Many of our intensive crops are handled by farmers of foreign extraction who have an inbred appreciation of fertilizer use. They are constantly demonstrating its profit possibilities, and have exerted no little influence in overcoming the idea that the use of fertilizer on our soils is wasteful.

A deterrent factor not common to other regions of the country is the occurrence of large areas of saline and alkaline soils. When this condition exists to such an extent the production of crops is limited, there is little that fertilizers can do. Over the years, the growers and the fertilizer industry have come to realize this, and now it is quite generally advocated that fertilizer sales be postponed for a period of time long enough to allow some salt- or alkali-corrective measure to fit the soil for fertilizer response.

Lack of information on the numberless phases of fertilizer usage in our western agriculture looms as a much greater deterrent factor here than elsewhere in the country. Fertilizer will not be used if its effectiveness cannot be depended upon. The job of finding out where to use the various nutrient elements and how to use them to insure a more productive agriculture has seemed interminable, if not hopeless, under our conditions of the most diverse crop category in the world, super-imposed upon an even more diverse layer of soil types.

All of us who have worked at the task of developing reliable agricultural information know that it takes time. The field of soils and plant nutrition is no exception. It appears now, however, that many more people are intersted and working in the West on these problems, and that fertilizer information of direct benefit to the grower is becoming available at a much faster rate. This augurs well for the fertilizer industry. It is inconceivable that the need for fertilizers will be statically small, as our soils are cropped continuously and more fertilizer information based on local experience is developed.

More intensive study of the nutrition of California's citrus groves may mean changing concepts and greater fertilizer use

Use of Diagnostic Tools

Actually, of greatest help in checking some of these slow-down factors in fertilizer use has been the development of diagnostic techniques which could be used and interpreted under our regional conditions. Salinity tests on the soil are being made for growers in increasing numbers. At the most recent meeting of the California Fertilizer Association, Dr. Frank Bingham of the University of California reported on a soil test for phosphate which promises to greatly facilitate appraisal of our soils for this nutrient. Leaf analysis procedures have been of practical value in locating potash needs in orchards and vineyards as well as indicating injurious excesses of sodium. Plant symptoms or hunger signs have been used extensively to recognize the needs for zinc, iron, and manganese. It is very encouraging to have more adequate tools for making fertilizer recommendations, and especially for locating demonstrational work in the field so that results will be in favor of fertilizer use, not against it. In the past, many field demonstrations have been placed blindly and have resulted in a negative score for fertilizer. The grower with a problem is not much interested in negative results. These diagnostic tools are helping workers to identify the problem before tackling it.

The Next Ten Years

What are some of the developments which will influence the use of fertilizer and enlarge its role in Far West agriculture in the next decade? It is not likely that farm income will surpass the figures attained in the past decade, so this cannot be forecast as a force to boost fertilizer tonnage. We will have to turn again to the forces of research and education, for this is the only way to build a permanent base for fertilizer tonnage. Through

(Continued on page 54)

BALTIMORE

Digging potatoes in Houlton, Me., fifty years ago—and today—photos loaned by Jim Totman, Summers Fertilizer Co., Baltimore, Md.

SECOND OF THREE INSTALLMENTS

Prepared by the INDUSTRIAL BUREAU *Baltimore Association of Commerce*

Baltimore's First Commercial Fertilizer Plants

It seems that good fertilizer should contain, in proper parts, three principal ingredients: nitrogen, which hastens the growth of plants; phosphoric acid, which stimulates early root growth and the speedy maturity of crops; and potash, which aids the formation of starch and gives body and health to the plant.

The use of Peru and Navassa guanos, containing much nitrogen and some potash, was a long forward step toward a satisfactory food for the soil; but it was not the final answer. The problem was solved around 1840 when a German chemist, Justus von Liebig, treated bone and other substances containing lime with sulphuric acid to produce phosphoric acid, so essential to the quick growing of crops.

It was almost a decade later, however, on March 27, 1349 to be exact, that Philip S. Chappell and William H. Chappell were granted the initial patent in this country for manufacturing a compounded fertilizer. Both were Baltimoreans and evidently related. Dr. Philip S. Chappell had erected the second sulphuric acid plant in this city in 1836, and at the time the patent was secured was operating the factory with much success.

The discovery of this nation's first mixed fertilizer patent was by J. E. Totman, president of the Summers Fertilizer Company. The patent establishes the date officially accepted by the fertilizer industry as its beginnings.

The formula, chemists point out, was very good, indeed. It combined the superphosphate process, the use of liquid ammonia, of potash and the inclusion of secondary and probably minor eleemnts.

Even then, however, with a formula combining all the essentials of cheap and satisfactory commercial fertilizer, the industry was slow to develop along the new scientic line.

It would seem that the manufacture and sale of fertilizer according to the new formula was given to P. Stockton Chappell, a chemist and evidently a relative, whose office was at 160 Lombard street. In 1853 a city business directory lists him as a manufacturer of "Chappell's fertilizer," the plant's location being given the same as Chappell's Chemical Works. Doubtless a section only of that plant was devoted to production of the new fertilizer. In the following years this plant was given over entirely to the manufacture of fertilizer. In the '70's it was the largest in this field in the United States.

It was not until 1857 that Gustavus Ober, John Kettlewell, and other Baltimoreans started this city's first strictly commercial fertilizer plant—Ober & Kettlewell—in a building on Hamburg Street East of Riverside Ave., presumably adjoining the Davison & Kettlewell sulphuric acid plant erected there in 1832. The following year John S. Reese & Co. became interested in the commercial production of fertilizer.

Industry Expands Rapidly

In the decade before the Civil War, as a result of new and valuable formulas, together with an ample supply of guano, the fertilizer industry grew by leaps and bounds. The South began to absorb Baltimore's fertilizer almost at the time its nearby market was fully covered. And then, most disastrously, came the Civil War, which not only brought about an hiatus in fertilizer production, but destroyed for a time the city's Southern markets. Indirectly, however, the industry profited as a result of the war, for in place of the customary large Southern plantations, there developed many small farms. With the owner possessed of less land it was necessary that he raise larger crops

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per acre. This, he found, was possible through use of fertlizer.

And so in the 1860's and 1870's local fertilizer plants were again busy, producing more than half the total consumed in the United States. The fertilizer industry had grown into one of the most valuable in all Baltimore. Among the more important Baltimore fertilizer plants in the 1870's were: Maryland Fertilizing & Mfg. Co. at Canton; the Dungannon Works of Joshua Horner, Jr., "bone dust" manufacturer whose plant at Chew and Stirling Streets was burned in 1878 and rebuilt immediately "on the Middle Branch of the Patapsco River," its wharves "exceeding any private wharves built for 30 years past;" Piedmont Guano & Mfg. Co. begun in 1869 at Locust Point, later moved to Curtis Creek, and whose plant is now occupied by The Cooperative Southern States Fertilizer Service, Inc.; W. Whitelock & Co. which operated two plants near Federal Hill, and the founder of which established the Old Town Bank, in 1858; Isaac Reynolds & Sons, foot of Hughes Street; Chappell's Chemical Works, Jackson, Cross and West Streets; R. W. L. Rasin & Co., Cross and Covington Streets; Davison, Kettlewell & Co. on Haven Street, near Danville Avenue, where the Gross Candle Co. was later located; John S. Reese & Co.; G. Ober & Sons, Hill Street, Locust Point; Patapsco Chemical Works, foot of Andre Street, Locust Point, on Middle Branch; Woodside, Griffith & Hoblitzel, on the site now occupied by the Bendix Radio Corp., 920 E. Fort Avenue.

Raw Material Assembled From Many Lands

By this time, too, the guano of Peru and Navassa had been fully superseded by manufactured fertilizer, the guano being simply one of the ingredients of the finished product. It is most interesting to note that these various items used at that time in the manufacture of fertilizer were assembled from nearly all sections of the earth. Mineral phosphate arrived from France, Spain, England, Canada and South Carolina; tankage from the large slaughter houses of the Middle West; fish scrap, or dried fish, bone black, bone and brimstone from Sicily; guano from Peru, Navassa and Mexico; and kainit and other potash from Germany. "All these," a writer of that day explains, "are made available by solution in acids of proper strength, ammoniac and phosphoric acids being the most valuable to soil in the production of crops."

The U. S. Census of Manufacturers lists fertilizers or "manufactured manures" for the first time in 1870 when five Baltimore establishments' products were valued at $476,300; by 1880 the industry had grown to 18 firms whose products were valued at $4,287,398; in 1890, 25 fertilizer companies with products valued at $3,957,345; and in 1900 there were 17 such establishments with a manufactured goods valued at $3,752,329.

Toward the end of the past century a list of the more prominent fertilizer works in and around Baltimore included Detrick Fertilizer & Chemical Works of Canton, one of Canton's principal industries; the Chesapeake Guano Company at Spring Gardens, later The Chesapeake Chemical Works, and still later Slingluff & Co., another major establishment, its works covering three acres; the Patapsco Guano Co., at what it now the location of the Mutual Chemical Company's wharf, first begun on a small scale in 1865, destroyed by fire in 1877, and immediately rebuilt; the Powell Fertilizer & Chemical Co., which maintained at Annapolis Junction a well-known experimental farm; the Lazaretto Chemical & Fertilizer Co. at Canton, owned by George W. Graflin & Son, which was said to be the largest in the city; G. Ober & Sons, the oldest of them all; the Baltimore Chemical Works of William Davison & Co. at Fells Point; The Maryland Fertilizing & Mfg. Co., Canton; Lorentz & Rittler, Leadenhall and Stockholm Sts., which also operated a sulphuric acid plant.

(Continued on page 56)

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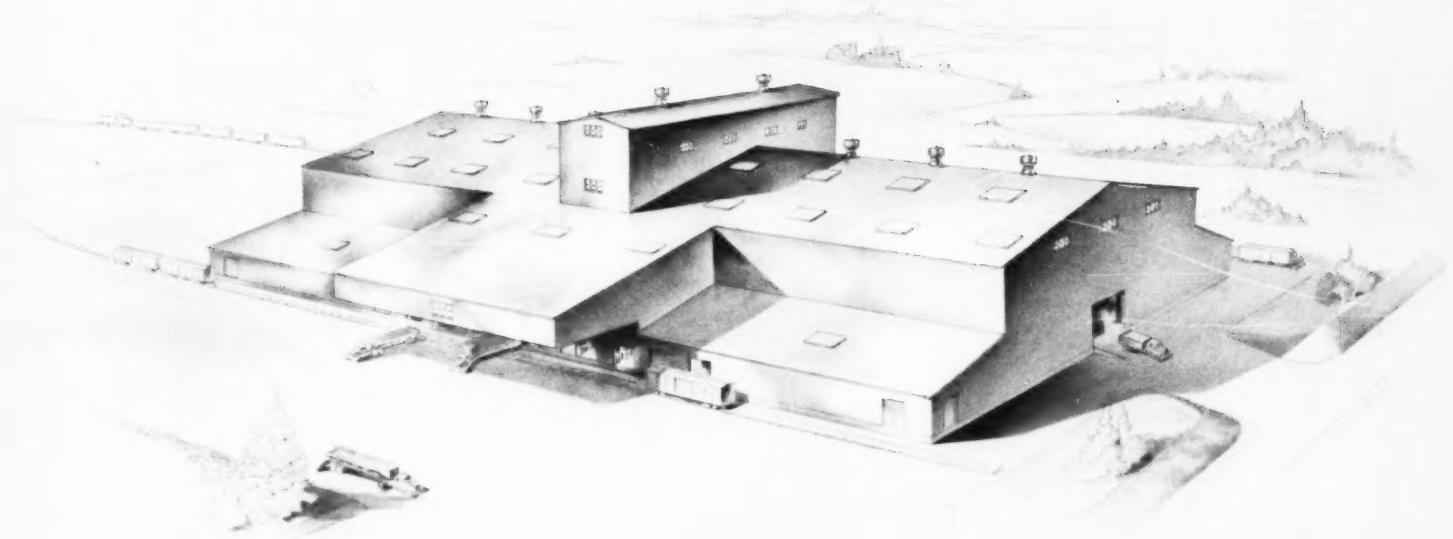

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WORLD-WIDE FERTILIZER REPORT

FINAL INSTALLMENT

POTASH

World Situation: World production and consumption of potash (K_2O) for 1949-50 and 1950-51 are difficult to estimate with a desirable degree of accuracy, because official data are not available for the important potash-producing areas of Eastern Germany or for the former Polish mines now operated by the U.S.S.R. Similarly, official data are not available for potash consumption in Eastern Germany, Poland, or for most of the Balkan countries normally dependent on these sources of supply. Unofficial figures must therefore be given for these areas, which constitute over one-fourth of the world's production, and for which relatively slight variations in estimates are of great significance to the estimates of the world total.

From the best information available, the estimates of production in the Soviet Zone of Germany and the former Polish mines in 1949-50 range from about 850,000 to more than 1 million tons K_2O. On the assumption of 1 million tons production, it is estimated that about 650,000 tons were consumed in Eastern Germany, Poland, the Balkan countries, and adjacent areas in the U.S.S.R., and that some 350,000 tons were available for export to outside areas. With emphasis on the reservation that these data are necessarily subject to modification as more accurate information becomes available, the following appraisal as of this date of the current world position of potash production and consumption is given.

On the basis of production in this area amounting to 1 million tons, world production of potash in 1949-50 is estimated to be about 3.7 million tons K_2O and consumption 3.6 million tons. Even though official estimates for some areas are not available, there is every indication that the world production of potash in 1949-50 was sufficient to meet effective demand in most countries. Because of strikes, available supplies in the United States were less than could have been used if more potash had been available.

For 1950-51, it is estimated that production will be about 4.1 million tons and consumption 3.9 million tons. If indicated total production as estimated at present is fully realized and if consumption is no greater than estimates now made, the available supply of potash in 1950-51 will be in excess of effective world demand.

This world position may be attributed to many causes outside the field of agronomic necessity. Prominent among them is the difficulty encountered in many countries in effecting imports of commercial fertilizers. In many cases financial and exchange problems prevent or limit imports. Faced with the necessity of implementing only a part of the supplies for the desired fertilizer program, the tendency in some countries, especially in tropical and subtropical areas, is to give preference to nitrogen as being, under their agricultural conditions, the most needed element. This primary need may be followed by supplies of phosphates and potash.

Consumption of the three plant nutrients in Asia, South America, and Africa for 1949/50 and 1950/51 is as follows:

Continent	N		P_2O_5		K_2O	
	1949/50a	1950/51b	1949/50a	1950/51b	1949/50a	1950/51b
	Thousand metric tons					
Africa	128	131	120	144	34	34
Asia	727	767	312	360	147	160
South America	56	65	83	93	24	26
Total	911	963	515	597	205	220

a Preliminary. b Outlook

While the above is the over-all position for each of these continents, variations from the pattern exist. In Japan for instance, relatively larger tonnages of potash are used. Ultimately, with the greater use of nitrogen and the depletion of soil resources, the agronomic need for potash will become more urgent. In some areas, the present systems of crop production depend largely on soil reserves for their potash supply.

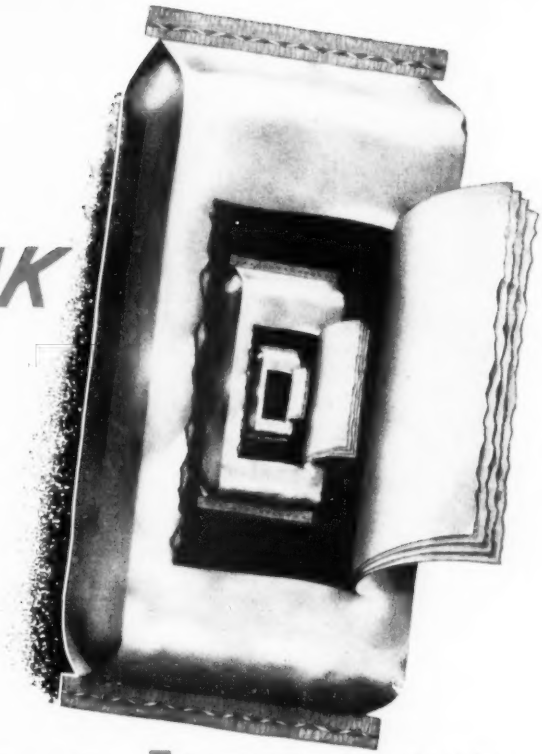
Production and Consumption: Estimated potash production and consumption by continents for 1948-49 and 1950 are summarized in Table 4. Data for individual countries are in the Appendix.

Table 4. – Production and Consumption of Potash, 1948/49 and 1949/50

Continent	Production		Consumption	
	1948/49	1949/50	1948/49	1949/50
	Metric tons K_2O			
Europe	2,281	2,812	2,023	2,408
N. and C. America	965	895	1,003	973
South America	10	11	23	24
Asia			192	147
Africa			32	34
Oceania	1	1	8	17
Total a	3,257	3,719	3,281	3,602

a Total may differ from sums due to rounding.

BAGPAK



Fertilizer manufacturers account for a large part of the many millions of multiwall paper bags supplied every year by Bagpak. There are good reasons:

1 Bagpak pioneered the use of paper bags for fertilizer in 1932.

2 Since then, Bagpak has produced high-quality multiwall paper bags of *every type* for fertilizer.

3 Consistent quality and service have led to a steady increase in the use of Bagpak bags by the fertilizer industry.

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The increase in **production** in Europe was primarily in Germany, including the former Polish mines, and in France. In the United States, production fell from the record of 1948-49, owing to a strike at one of the major producing centers.

Production in Australia is reported to be in the form of muriate of potash and manure salts. A production of 300 tons is noted in Switzerland and 300 tons in South Africa. Sulphate of potash is manufactured in some countries from imported muriate of potash. The trend in some countries is to search for natural resources capable of supplying potash, to meet at least a part of the indigenous requirements. An important reason for this trend is the monetary difficulties in arranging imports.

New production of potash is planned in Chile through the greater recovery of plant nutrients from the original ores by the solar evaporation of a solution made by washing the formerly discarded tailings. The production is reported to be a mixture of approximately 30 percent potassium nitrate and 70 percent sodium nitrate with traces of minor elements as in the present production.

World **consumption** of potash in 1948-49 utilized that year's production as well as stocks in Europe carried over from the previous year. Consumption in 1949-50, while 10 percent above 1948-49, is estimated at slightly less than production. In Europe consumption increased with available supplies, while in North America larger imports did not entirely compensate for the lower production. The drop in Asia reflects lower consumption in Japan.

TABLE A. — NITROGEN: Production for Years Ending 30 June 1949, 1950, and 1951

Country	1948-49	1949-50 Preliminary	1950-51 Outlook
	(. . .	Metric tons N . . .)	
Europe			
Austria	59,000	66,000	72,000
Belgium	152,130	160,000	160,000*
Czechoslovakia	29,950	30,000*	30,000*
France	187,500	214,000	238,000
Germany — All Zones	437,600*	556,000*	625,000*
Western Zones	(327,600)	(426,000)	(475,000)
Soviet Zone	(110,000)*	(130,000)*	(150,000)
Hungary	4,000*	4,000*	4,000*
Italy	104,330	130,000	150,000
Netherlands	86,080	120,000	200,000
Norway	107,500	148,020	163,000
Poland	55,080	60,000*	65,000*
Spain and DOT's	3,370	8,500	8,500*
Sweden	21,540	21,310	24,150
Switzerland	10,600	12,500	12,500*
United Kingdom	280,800	271,250	270,000
Yugoslavia	1,890	2,500*	2,500*
Total	1,541,370	1,804,080	2,024,650
North and Central America			
Canada	175,420	180,680	182,000
Mexico	600*	600*	10,350
United States	975,000	1,050,000	895,000
Total	1,151,020	1,231,280	1,087,350
South America			
Brazil	800	800*	800
Chile	275,270	277,250	289,600
Peru	22,210	24,990	26,500
Total	298,280	303,040	316,900
Asia			
Taiwan	2,090	3,720	9,500
India	12,630	10,900	13,000 a
Japan	274,070	343,420	382,000
Korea, North	20,000*	30,000*	20,000*
Turkey	500	500*	500*
Total	309,290	388,540	425,000
Oceania			
Australia	9,190	9,300	12,800
New Zealand b	1,750	1,750	1,750
Total	10,940	11,050	14,550
TOTAL	3,310,900	3,737,990	3,868,450 a

SOURCE: Data presented by governments. Unofficial figures are derived from trade and other sources and are subject to confirmation.

a/ Excludes token shipments from new plants.

b/ Dried blood, etc.

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NFA

(Continued from page 23)

METHODS

Requests for duplicate copies of these slides from teachers and others interested in agriculture, markedly increased during 1949-50, bringing the total number of copies requested to about 20,000.

4. Motion Pictures In Color. In order that farmers and others interested in agriculture may have the visual benefit of progressive research in the study of soils, crops and plant nutrients, The National Fertilizer Association has produced three sound-and-color motion pictures. The most recent film, "What's in the Bag," had its premiere in 1949.

These pictures are made available for loan to extension specialists, county agents, vocational teachers and other agricultural workers as well as to Association members. The borrower incurs no cost except that involved in returning the film to the Association or in forwarding it to the next user.

Beginning in 1949 NFA also offered its services to regional agricultural groups wishing to make motion pictures. The first picture so produced was "The Green Pastures of New England," a cooperative undertaking with the Green Pastures Committee of that area. Other similar projects are now under way in California and in Kentucky.

RESULTS

NFA's motion pictures in color have been enthusiastically received by agricultural audiences everywhere.

In 1949-50 alone 8,258 showings were presented with a reported attendance of close to 500,000 persons.

Here are typical comments on NFA's latest film, "What's in the Bag":

"I think the film tells a real story and gives farmers very much needed information relative to the materials that are used in the manufacture of mixed fertilizers . . . I have said for years this is just what farmers want to know—where the

UN TABLE B.—NITROGEN: Consumption for Years Ending 30 June 1949, 1950, and 1951

Country	1948/49	1949/50 Preliminary	1950/51 Outlook
		(. . . Metric tons N . . .)	
Europe			
Austria	19,600	20,500	22,000
Belgium	72,600	75,000	75,000*
Czechoslovakia	30,000	35,000*	40,000*
Denmark	45,400	59,000	70,000
Finland	13,210	13,500	20,000
France and DOT's	224,000	225,000	255,000
Germany — All Zones	445,540*	440,000*	550,000*
Western Zones	(335,540)	(310,000)	(400,000)
Soviet Zone	(110,000)*	(130,000)*	(150,000)*
Greece	19,600	25,000	35,000
Hungary	800*	1,400*	1,400*
Iceland	2,340	2,500	2,750
Ireland	7,300	6,100	15,700
Italy	109,930	125,000	165,000
Luxembourg	3,100	3,100	3,100
Netherlands	116,500	140,000	150,000
Norway	25,220	39,000	41,000
Poland	58,440	70,000*	75,000*
Portugal and DOT's	17,000	23,000	23,000*
Spain and DOT's	45,540	58,500	65,000*
Sweden	40,660	55,010	55,350
Switzerland	7,200	7,500	7,500*
United Kingdom	187,600	198,100	198,100*
Yugoslavia	1,890	2,500*	2,500*
Total	1,493,470	1,624,710	1,872,400
North and Central America			
Canada	31,720	32,820	33,500
Costa Rica	820	850*	850*
Cuba	9,090	10,270	14,480
Dominican Republic	790	210	1,400
El Salvador	300	390	400*
Guatemala	540	600*	600*
Honduras	1,620	2,000*	2,000*
Mexico	5,750	4,900	6,210
Panama	840	1,000*	1,000*
United Kingdom DOT's	5,220	5,630	6,170
United States & Possessions	915,000	935,000	960,000
Total	971,690	993,670	1,026,610
South America			
Argentina	5,630	6,000*	6,400*
Bolivia	10	20	40
Brazil	9,030	10,000*	12,000*
Chile	8,140	8,140	8,140
Colombia	1,180	1,500	2,500
Ecuador	140	150	180
Peru	26,380	26,590	31,500
United Kingdom DOT's	2,230	2,270	2,410
Uruguay	190	250*	300*
Venezuela	1,100	1,200*	1,200*
Total	54,030	56,120	64,670
Asia		(. . . Metric tons N . . .)	
Burma	100	30	40
Ceylon	12,700	14,500	14,500*
India	49,150	114,060	113,000
Indonesia	4,750	4,990	5,000*
Iraq	40	60	60*
Israel	2,750	3,820*	6,500*
Japan and Ryukyus	300,000	411,000	406,000
Korea, South	75,000*	100,000*	125,000*
Korea, North	5,000*	10,000*	10,000*
Lebanon	1,140	1,360	1,480
Pakistan	3,620	5,000*	5,500*
Philippines	12,000*	14,000*	16,000*

(Continued next page)

stuff comes from."—C. J. Chapman, extension specialist, University of Wisconsin.

"In my opinion, you have produced the most educational film regarding mixed fertilizers . . . it's a revelation to most farmers."—H. A. Hanemann, assistant manager, Pennsylvania Farm Bureau Cooperative Association.

"An excellent movie for use with the students at the college and with our extension agents."—Jack T. Sloan, visual aids specialist, Texas A.&M. College.

III. COOPERATING WITH OTHER GROUPS.

METHODS

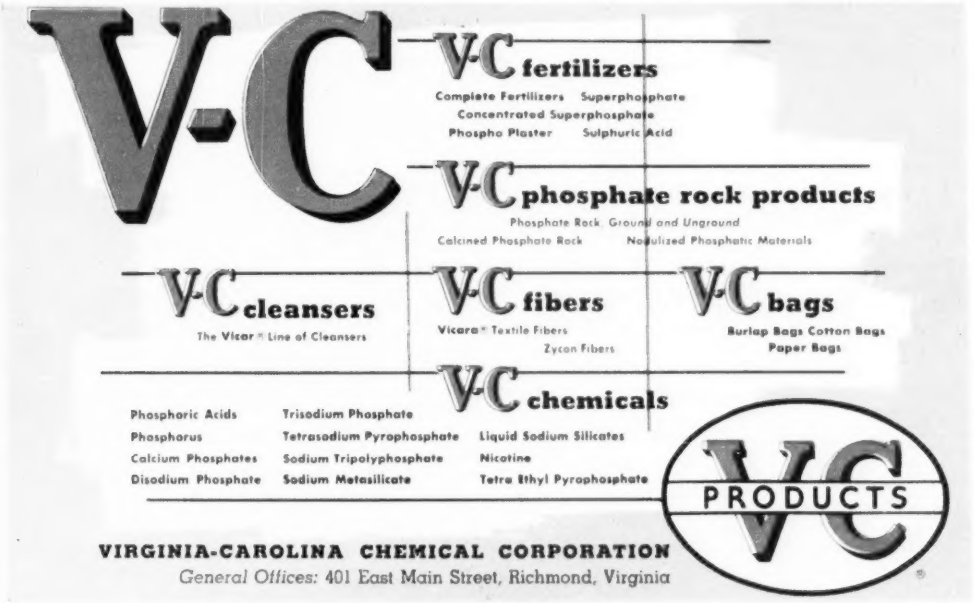
The keynote of NFA's program is to work with other agricultural and industrial groups interested in promoting a sound American agriculture.

The Association's Plant Food Research Committee, composed of outstanding agronomists from the industry, serves as a clearing-house for agronomic problems, and aids in correlating and promoting fertilizer-

UN TABLE B.—NITROGEN: Consumption for Years Ending 30 June 1949, 1950, and 1951 (Concluded)

Country	1948–49	1949–50 Preliminary	1950–51 Outlook
Saudi Arabia	60	100*	150*
Syria	460	500	600*
Taiwan	20,710	39,310	54,340
Thailand	600	800*	800*
Turkey	4,300	3,250	3,500*
United Kingdom DOT's	4,300	4,200	4,290
Total	496,680	726,980	766,760
Africa			
Belgian Congo	220	250*	250
Egypt	76,000	109,000	109,000
Union of South Africa	8,000	9,000	9,500
United Kingdom DOT's	7,820	9,950	12,410
Total	92,040	128,200	131,160
Oceania			
Australia	13,300	15,000	21,330
New Zealand	2,000	3,750	3,750
United Kingdom DOT's	30	140	230
Total	15,330	18,890	25,310
TOTAL	3,123,240	3,548,570	3,886,910

SOURCE: Data presented by governments. Unofficial figures are derived from trade and other sources and are subject to confirmation.



use research by the Nation's soil scientists. It cooperates with the Committee on Fertilizer of The American Society of Agronomy, the Committee on Fertilizer of the Association of Southern Agricultural Workers, the U. S. Department of Agriculture, State agricultural experiment stations and other organizations, in connection with experiments related to the use of fertilizers.

The National Joint Committee on Fertilizer Application is a cooperative organization which promotes research among governmental agencies and commercial organizations on the proper utilization of fertilizer with particular consideration for placement, time of fertilization, and machinery for fertilizer distribution. The membership of the Committee includes The American Society of Agricultural Engineers, The American Society of Agronomy, The American Society for Horticultural Science, The Farm Equipment Institute, The National Canners Association and The National Fertilizer Association.

RESULTS

The cooperative efforts have substantially contributed to the cordial and valuable relations which generally prevail today among scientists, manufacturers, farm leaders and farmers themselves. These groups increasingly realize that, however diverse their separate interests may be, none can succeed without the cooperation of the others.

A strong economy rests on an agricultural base of many components. The smooth interplay between these components is essential to the study of common problems and their solution. The amazing capacity of American agriculture today is largely a result of this cooperative effort, and The National Fertilizer Association is proud to be making its contribution.

METHODS

The Association encouraged and aided the formation of the Phosphate Research Committee on a broad industry basis. The Committee fosters and supports research on the fundamental principles of

UN TABLE C.
SUPERPHOSPHATES, BASIC SLAGS, AND OTHER FORMS OF PHOSPHATES
Production for Years Ending 30 June 1949, 1950, and 1951

Country	1948/49		1949/50 Preliminary		1950/51 Outlook	
	Superphosphate	Total phosphoric acid a/	Superphosphate	Total phosphoric acid a/	Superphosphate	Total phosphoric acid a/
	Metric tons P2O5					
Europe						
Belgium	119,700	263,160	114,080	235,080	114,080*	235,080*
Czechoslovakia	30,680	55,330	30,680*	55,330*	30,680*	55,330*
Denmark	75,300	75,300	75,600	75,600	75,600	75,600
Finland	31,790	34,480	47,690	54,650	50,000*	60,000*
France	266,180	426,860	192,000	437,500	195,500	500,000
Germany—						
All Zones	98,890*	323,440*	108,000*	367,000*	150,000*	450,000*
West. Zones	(63,890)	(280,440)	(68,000)	(317,000)	(100,000)	(385,000)
Soviet Zone	(35,000)*	(43,000)*	(40,000)*	(50,000)*	(50,000)*	(65,000)*
Greece	14,500	14,500	25,000	25,000	35,000	35,000
Hungary		4,000*		4,000*		4,000*
Ireland	19,100	24,000	19,500	23,900	24,000	29,500
Italy	247,310	251,120	268,000	275,000	283,000	290,000
Luxembourg	0	94,000	0	69,000	0	71,000
Netherlands	151,550	163,190	155,000	167,000	155,000*	170,000
Norway	6,300	10,900	8,400	13,400	10,000*	18,400
Poland	40,000*	50,000*	40,000*	50,000*	40,000*	50,000*
Portugal	41,000	41,000	45,000	45,000	45,000*	45,000*
Spain	120,000	120,000	136,000	136,000	136,000*	136,000*
Sweden	78,800	80,920	79,950	82,500	87,750	90,300
Switzerland	2,800	9,100	1,230	6,900	1,230*	6,900*
United Kingdom	214,210	327,970	223,500	337,180	235,800	349,430
Yugoslavia	2,000*	2,000*	2,000*	2,000*	2,000*	2,000*
Total	1,560,110	2,371,270	1,571,630	2,462,040	1,670,640	2,673,540
N. and C. America						
Canada	35,000*	109,630	36,000*	112,920	37,000*	114,000
Cuba	1,540	5,080	90	3,630	900	7,240
Mexico	3,800	4,000	7,600	7,800	7,600*	7,800*
United States	1,720,000	1,870,000	1,670,000	1,810,000	1,700,000*	1,850,000
Total	1,760,340	1,988,710	1,713,690	1,934,350	1,745,500	1,979,040
South America						
Argentina	1,000	5,000*	1,000	5,000*	4,000*	9,000*
Brazil	5,200	5,200	5,200	5,200	13,200*	13,200*
Chile	6,120	14,290	5,600	14,330	5,600	14,330
Colombia	160	160	200	200	300	300
Ecuador	360	360	420	420	420*	420*
Peru	0	16,820	0	19,430	0	21,290
Uruguay	300	300	300	300	300*	300*
Total	13,140	42,130	12,720	44,880	23,820	58,840
Burma	0	80	0	50	0	60*
India	5,120	5,120	10,930	10,930	16,000	16,000
Israel			1,870	1,870	7,200	7,200
Japan and Ryukyus	166,500	166,500	215,200	220,300	220,000*	250,000
Korea, South	1,000*	1,000*	1000*	1,000*	1,000*	1,000*
Taiwan	3,140	3,140	6,590	6,590	7,920	7,920
Turkey	1,110	1,110	1,110*	1,110*	1,110*	1,110*
Total	176,870	176,950	236,700	241,850	253,230	283,290
Africa						
Egypt	7,500	7,500	8,400	8,400	13,500	13,500
Fr. North Africa	36,000*	36,000*	36,000*	36,000*	36,000*	36,000*
U. of S. Africa	65,000	65,000	82,000	82,000	90,000	90,000
Total	108,500	108,500	126,400	126,400	139,500	139,500

(Continued next page)

phosphate utilization by plants and phosphate fixation and release by soils, through the use of radioactive phosphorus as the research tool. The Bureau of Plant Industry, Soils and Agricultural Engineering, U. S. Department of Agriculture, carries on the work in cooperation with a number of State agricultural experiment stations.

Personal contacts by staff members with Government agricultural workers, help correlate agriculture and industry programs.

IV. AIDS TO THE INDUSTRY.

METHODS

1. The Fertilizer News. A bi-weekly, keeps members informed on developments that affect the industry. The 1950 issues have helped to serve as a medium through which members are encouraged to celebrate the industry's centennial with the people in their specific areas. Suggestions for doing this have been offered.

RESULTS

The **Fertilizer News** is viewed by NFA members as the source from which they regularly learn the industry news so essential to up-to-date operation of their businesses. From its pages, the press also learns the industry's viewpoint on matters involving commercial fertilizers.

METHODS

2. Seals, Ads and Posters have been prepared for members' use. The embossed seals embody the centennial theme; the ads and posters carry suggestions for sales promotion.

RESULTS

Two hundred thousand centennial seals have been purchased by members for use on their letterheads and other papers going to the public. Posters likewise have been distributed and their suggestions have been incorporated in national and local ads of many firms.

METHODS

3. Statistical Service Letters and consumption reports provide members with figures on over-all fertilizer production and sales activity in the United States.

UN TABLE C.

SUPERPHOSPHATES, BASIC SLAGS, AND OTHER FORMS OF PHOSPHATES

Production for Years Ending 30 June 1949, 1950, and 1951 (Concluded)

Country	1948/49		1949/50 Preliminary		1950/51 Outlook	
	Superphosphate	Total phosphoric acid a/	Superphosphate	Total phosphoric acid a/	Superphosphate	Total phosphoric acid a/
			Metric tons P2O5			
Asia						
Oceania						
Australia	318,000	318,000	345,000	345,000	382,000	382,000
New Zealand	118,700	124,700	131,000	135,000	131,000*	135,000*
Total	436,700	442,700	476,000	480,000	513,000	517,000
TOTAL	4,055,660	5,130,260	4,137,140	5,289,520	4,345,690	5,651,210

SOURCE: Data presented by governments. Unofficial figures are derived from trade and other sources and are subject to confirmation.

a/ Excluding phosphate rock.

UN TABLE D.—PHOSPHORIC ACID: Consumption of Phosphoric Acid (Excluding Ground Rock Phosphate)

For Years Ending 30 June 1949, 1950, and 1951

Country	1948/49	1949/50 Preliminary	1950/51 Outlook
		Metric tons P2O5	
Europe			
Austria	25,600	34,400	40,000
Belgium	90,000	90,000	90,000*
Czechoslovakia	60,000*	60,000*	60,000*
Denmark	71,700	77,400	80,000
Finland	67,740	57,900	75,000
France	348,750	370,000	425,000
Germany — All Zones	460,860*	425,000*	465,000*
Western Zones	(390,860)	(350,000)	(385,000)
Soviet Zone	(70,000)*	(75,000)*	(80,000)*
Greece	14,500	25,000	35,000
Hungary	8,000*	10,000*	11,000*
Iceland	990	1,050	1,300
Ireland	41,300	50,800	76,200
Italy	219,610	240,000	288,000
Luxembourg	5,900	6,000	6,000
Netherlands	121,970	125,000	130,000
Norway	32,310	39,000	39,500
Poland	50,000*	55,000*	60,000*
Portugal and DOT's	41,000	45,000	45,000*
Romania	2,000*	2,000*	2,000*
Spain	120,000	136,000	136,000*
Sweden	80,920	94,780	94,780
Switzerland	30,000	27,000	27,000*
United Kingdom	379,200	410,200	410,200*
Yugoslavia	3,000*	3,000*	3,000*
Total	2,275,350	2,384,530	2,599,980
North and Central America			
Canada	101,640	104,690	106,000
Cuba	11,010	10,410	20,210
Dominican Republic	800	240	1,500
El Salvador	220	220*	220*
Guatemala	800	800*	800*
Mexico	7,200	4,000	7,600
United Kingdom DOT's	360	360	450
United States	1,770,000	1,740,000	1,775,000
Other Cent. Amer. Republics	500*	500*	500*
Total	1,892,530	1,861,220	1,912,280

(Continued next page)

RESULTS

The Statistical Service Letters and consumption reports are considered by members a source of vital information on fertilizer industry trends. The annual NFA consumption report receives wide attention in the press.

METHODS

4. A Help In Your Business, a pamphlet, outlines ways in which NFA serves the industry.

RESULTS

A Help In Your Business, not only has helped recruit new Association members but gives to other interested persons a bird's-eye view of the services the Association performs.

BEAR

(Continued from page 25)

matter. To overcome this loss and restore the granules, it is necessary to seed the land down regularly to some type of sod crop whose tops form an umbrella that stops the fall of the rain before it reaches the soil, while its roots aid in the regranulation process.

It is important to keep in mind that roots and roothairs are far superior to any other type of organic matter that can be added to the soil. In growing, the roots dry out the soil and aid in its granulation. On dying, they add fresh supplies of organic matter. As the roots and other crop residues are acted on by soil microbes, their organic substance becomes an intimate part of

UN TABLE D.—PHOSPHORIC ACID: Consumption of Phosphoric Acid (Excluding Ground Rock Phosphate) For Years Ending 30 June 1949, 1950, and 1951 (Concluded)

Country	1948/49	1949/50 Preliminary	1950/51 Outlook
	(. . . Metric tons P_2O_5 . . .)		
South America			
Argentina	6,500*	6,500*	6,500*
Brazil	22,000*	25,000*	30,000*
Chile	22,570	24,730	25,380
Colombia	1,620	3,500	6,000
Ecuador	550	1,000	1,500
Peru	16,820	19,430	21,340
United Kingdom DOT's	520	910	610
Uruguay	1,500*	1,500*	1,500*
Venezuela	450*	450*	450*
Total	72,530	83,020	93,280
Asia			
Burma	110	50	60*
Ceylon	2,700	3,600	3,600*
India	5,120	10,930	16,000
Indonesia	2,100	2,100	2,100*
Israel	2,500	7,420	10,200
Japan and Ryukyus	165,000	221,000	250,000
Korea, South	50,000*	50,000*	50,000*
Lebanon	520	620	670
Taiwan	8,500	11,570	21,920
Turkey	750	750*	750*
United Kingdom DOT's	3,470	4,420	4,490
Total	240,770	312,460	359,790
Africa			
Egypt	13,500	13,500	18,000
French North Africa	36,000*	36,000*	36,000*
Union of South Africa	60,500	67,500	85,000
United Kingdom DOT's	2,440	3,340	4,930
Total	112,440	120,340	143,930
Oceania			
Australia	318,000	345,000	382,000
New Zealand	141,000	156,000	156,000*
United Kingdom DOT's	200	470	530
Total	459,200	501,470	538,530
TOTAL	5,052,820	5,263,040	5,647,790

SOURCE: Data presented by governments. Unofficial figures are derived from trade and other sources and are subject to confirmation.

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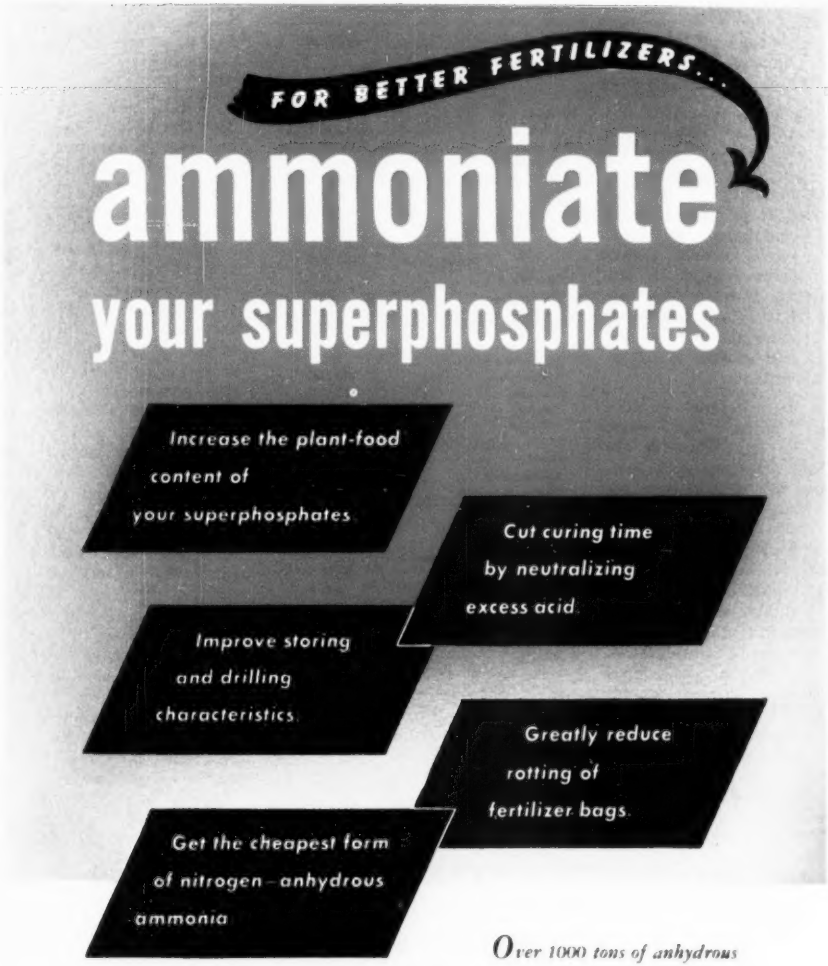
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the soil. The only feasible method of quickly getting large amounts of organic matter down deeply into the subsoil is through the growth of deep-rooted plants. In other words, it must be grown there.

It is at this point that fertilizers enter the picture in an especially important way. They stimulate not only much greater top growth of plants, but much greater root growth as well. In proportion as the soil is well fertilized and limed, roots are abundant, they spread throughout the plow depth of soil, and they grow down deeply into the subsoil. Thus by applying purely inorganic amendments to the soil one can add greatly to its organic-matter content.

During a 15-year test of four clean-culture crops, five small grains, and six hay crops at the West Virginia Agricultural Experiment Station, five tons of fertilizer raised the total crop yields from 41,000 to 118,000 pounds per acre. But it also greatly increased the organic-matter content of the soil, because of the much greater amount of roots and stubble that were left in and on the soil after the crops had been harvested. The increase in organic matter in the plow depth of soil amounted to 3,600 pounds for each ton of fertilizer applied. If the subsoil had been examined as well, several hundred additional pounds gain in organic matter would certainly have been shown. It seems safe to assume, therefore, that one ton of fertilizer, rightly used on land that needs it, can be made to add two tons of organic matter to the soil, even when all the crops are harvested and hauled away.

All that is needed to maintain the organic-matter content of the soil at a high level is to fertilize it liberally, lime it as required, and seed it down to sod crops from time to time. Thus, a corn crop, wheat and clover rotation can be made to meet all the requirements for adding soil-organic matter even if the corn stover, the wheat straw, and the clover hay are removed from the land. If part of these can be left on the land, or if they can be fed

UN TABLE E. — POTASH: Consumption for Years Ending 30 June 1949, 1950, and 1951

Country	1948/49	1949/50 Preliminary	1950/51 Outlook
	(. . . Metric tons K_2O . . .)		
Europe			
Austria	18,700	27,400	24,000
Belgium	125,000	125,000	125,000*
Czechoslovakia	24,490	30,000*	35,000*
Denmark	79,700	80,000	85,000
Finland	29,010	21,000	40,000
France	298,000	350,000	425,000
Germany — All Zones	907,310*	1,173,000*	1,280,000*
Western Zones	(557,310)	(625,000)	(700,000)
Soviet Zone	(350,000)*	(548,000)*	(580,000)
Greece	4,000	5,000	10,000
Hungary	1,000*	1,000*	1,500*
Iceland	770	920	1,000
Ireland	11,400	11,200	22,900
Italy	16,740	22,000	25,000
Luxembourg	2,100	2,600	2,800
Netherlands	130,000*	145,000	160,000
Norway	42,070	50,000	50,500
Poland	50,000*	50,000*	50,000*
Portugal	3,000	4,000	4,000*
Spain	26,000	35,000	35,000
Sweden	40,450	53,840	53,840
Switzerland	13,800	12,300	13,000*
United Kingdom	199,100	208,300	208,300*
Total	2,022,640	2,407,560	2,651,840
North and Central America			
Canada	51,000	52,530	53,000
Cuba	6,170	4,590	7,550
Dominican Republic	180	30	230
El Salvador	220	250*	250*
Guatemala	5,000	5,000*	5,000*
Mexico	850	530	1,340
United Kingdom DOT's	4,210	4,100	4,990
United States	935,000	905,000	950,000
Other Cent. Amer. Republics	550	600*	600*
Total	1,003,180	972,630	1,022,960
South America			
Argentina	1,600	1,600*	1,600*
Bolivia	20	20	20
Brazil	8,000	8,000*	8,000*
Chile	4,830	4,830	4,830
Colombia	2,370	3,000	4,500
Ecuador	190	200	250
Peru	4,500	5,070	5,420
United Kingdom DOT's	890	800	580
Venezuela	620	650*	650*
Total	23,020	24,170	25,850
Asia			
Ceylon	6,800	7,700	7,700*
India	960	960	960
Indonesia	370	600	600
Israel	720		2,500
Japan and Ryukyus	163,650	116,500	120,000*
Korea, South	15,000*	16,000*	20,000*
Lebanon	1,070	1,280	1,390
Taiwan	300	190	3,000
Turkey	1,000*	1,000*	1,200*
United Kingdom DOT's	2,290	2,340	2,340
Total	192,160	146,570	159,690

(Continued next page)

to livestock and returned as manure, so much the better.

Organic matter is the food of the many billions of soil microbes and of the million or more earthworms that inhabit every acre of good soil. Any practice that will add to the organic-matter supply in a soil will result in an increased number of living things in that soil. Here is where fertilizers and liming materials make one of their most important contributions. By their use much larger amounts of organic food are made available for the life in the soil. The living things in the soil consume organic matter. They do not produce it. It is only the higher plants, which grow above the soil where they have access to the sun, that produce organic matter. In proportion as these higher plants can be made to thrive, to spread their leaves out in the sun so the chlorophyll can get a chance to do its work, more organic matter will be synthesized from air and water.

Recently, after five years of growing sericea and harvesting the crop for hay, it was found that the live roots that remained in the top 18 inches of soil had a dry weight of 3,300 pounds per acre. In that acre, there were 1,320,000 earthworms, most of which were in the plow depth of soil, where the larger portion of the weight of roots was found. At the start of the test, this soil was given an application of two tons of limestone and 667 pounds of 0-12-12 fertilizer per acre, both of which were plowed under. At seeding time, 200 pounds of 5-10-10 were applied, and 400 pounds of 0-12-12 were used as a top dressing every year. The plants, the nodule bacteria on their roots, and the earthworms that lived on the crop residues all thrived under these conditions.

Fertilizers increase crop yields, and they are needed and used primarily for that purpose. But they are of equal importance for adding organic matter to the soil and for increasing the life in the soil. If land is kept under cultivation continuously, the soil-organic matter will be used up more rapidly than it is replaced by plant roots and corp residues. The answer to this difficulty is best found in taking the land out of cultivation part of the time and putting it into a sod crop. This means crop rotation. In lieu of this, it is necessary to grow cover crops and plow them under or to use animal manures or composts. But neither crop rotation, nor cover crops, nor manure, nor all of them put together will meet the needs for the kinds of quality yields that are required for profitable crop production. They must be supplemented with fertilizers and liming materials.

Farmers' experiences with fertilizers have been so satisfactory for

UN TABLE E. — POTASH: Consumption for Years Ending 30 June 1949, 1950, and 1951 (Concluded)

Country	1948/49	1949/50 Preliminary	1950/51 Outlook
	(. . . Metric tons K_2O . . .)		
Africa			
French North Africa	24,000*	25,000*	25,000*
Union of South Africa	6,000	6,000	6,000
United Kingdom DOT's	1,600	2,520	2,560
Total	31,600	33,520	33,560
Oceania			
Australia	6,220	8,710	8,770
New Zealand	2,000	8,500	8,500
United Kingdom DOT's	20	130	190
Total	8,240	17,340	17,460
TOTAL	3,280,840	3,601,790	3,911,360

SOURCE: Data presented by governments. Unofficial figures are derived from trade and other sources and are subject to confirmation.

UN TABLE F.—POTASH: Production for Years Ending 30 June 1949, 1950, and 1951

Country	1948/49	1949/50 Preliminary	1950/51 Outlook
	(. . . Metric tons K_2O . . .)		
Europe			
France	666,500	790,000	835,000
Germany — All Zones	1,447,010*	1,850,000*	2,100,000*
Western Zones	(647,010)	(850,000)	(1,000,000)
Soviet Zone	(800,000) *	(1,000,000) *	(1,100,000) *
Spain	166,000	170,000	185,000
Italy	680	700	700
Netherlands	1,080	1,000	1,000
Total	2,281,270	2,811,700	3,111,700
North and Central America			
United States	965,000	895,000	970,000
South America			
Chile	5,360	6,110	6,790
Peru	4,280	4,990	5,320
Total	9,640	11,100	12,110
Asia			
Israel			
Oceania			
Australia	1,000	780	270
TOTAL	3,256,910	3,718,580	4,094,080

SOURCE: Data presented by governments. Unofficial figures are derived from trade and other sources and are subject to confirmation.

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such a long period of time that many land owners have lost sight of some of the other essentials to good soil-management. In fact, fertilizers have been so badly used in so many cases that one would have thought they might have fallen into disrepute. Strangely, however, the only people who object to the use of fertilizers are folks who don't have any very important reason for using them. Propaganda against fertilizers thrives among city folks, who have only a yard or a small flower or vegetable garden at their disposal.

The controversy between the organic gardening city folks and the more practically minded farmers centers around the word "Nature." City farmers claim that fertilizers are contrary to Nature. Yet they are about the most natural things on earth. They came from the earth, and farmers are merely returning them to the earth.

The finest handiwork of Nature is man. The Psalmist says: "What is man that thou art mindful of him, and the son of man that thou visitest him? For thou hast made him a little lower than the angels, and hast crowned him with glory and honor. Thou madest him to have dominion over the works of thy hands, thou hast put all things under his feet, all sheep and oxen, yea, and the beasts of the field, the fowl of the air, the fish of the sea, and whatsoever passes through the paths of the seas."

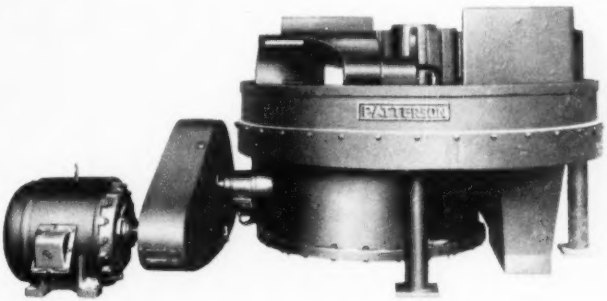
Of all the living things on earth, man is the only one that is capable of thinking and of acting upon his thoughts in a constructive manner. It is because of this that man is permitted to rule the earth. However badly he may appear to be doing this at times, the fact remains that he dominates his surroundings. After a million years of struggle against the elements, man finally discovered that he could put Nature's stores of phosphate rock, potash salts, nitrate of soda, limestone, and a great variety of other sea-derived substances to work on the land. And he found that he could draw on the atmosphere for additional nitrogen and for the elements that make up the necessary soil-organic matter. By so doing man has made it possible to reclaim worn-out land, to make good land better, and to put new life into all land. The fertilizer industry, one of man's most important contributions to mankind, stands between us and any possible shortages of food for centuries to come.

BROMFIELD

(Continued from page 27)

in this country hundreds of millions of acres of potentially good land producing nothing—farms abandoned, many of those acres tax delinquent. It is all potentially good productive land, and one of the things we know today which we didn't know in the past is how to make good soil, productive soil and balanced soil.

In all our agriculture, largely speaking, for a period of 200 years down to 50 years on our newest land, we have farmed that land only eight or nine inches deep. And one of two things happened, generally speaking. Either the land eroded away with the total loss of the original top soil, or that topsoil became so depleted by cropping of the mineral elements necessary to maintain available organic materials and moisture that the land went out of



This new type plasticizing pan, designed primarily for the phosphate fertilizer industry, has been put on the market by the Patterson Foundry & Machine Company of East Liverpool, Ohio. It is built in sizes up to 10 feet.

production—it ceased to produce enough to pay taxes and interest. There are hundreds of millions of acres of that land. The South has given us the extraordinary story of the bringing back of that land. I have watched the thing happening for a period of 10 or 12 years. A lot of it has been done through chemical fertilizer which permitted the farmer to grow the right kind of organic material to make soils productive.

Thanks to NFA

I am going to touch on just one more thing. I want to thank you all for bringing back into print **Hunger Signs In Crops**, because my life has been bedeviled for the last two years with letters from people asking why The National Fertilizer Association doesn't put out that book again. I recommended it in one of my books and I have been bombarded and I believe your office has been bombarded by demands for it. It is a book which in my opinion is about the finest in its field in the United States. It is a book which every farmer should have and every good farmer would have in his library. It is absolutely basic in relation to agriculture—to prosperous agriculture and to good soil. I want to thank you for bringing it back into print. You are doing a great service to the American farmer on the whole.

In that connection I would like to say also a word of appreciation of something else which you have been doing, and that is the education of the farmers with relation to what is good for the soil and what the proper use of chemical fertilizers can mean to them. Sometimes all of our government agencies together don't achieve the desired results. We had 20,000 farmers visit our farms last summer, and we are going to double that record this year. At the end of the evening they won't go home and sometimes it gets dark, milking time is past and we'll sit and talk, and finally before they go home they'll say "Well, why didn't somebody tell us this?" Now, that's a shocking thing when we recall that we are spending approximately two billion dollars a year on these State colleges, agricultural department extension services, and the rest of it. Two billion or more dollars a year to tell the farmers those things, but they are not getting to them! We are getting to them more through movies made by such organizations as yours, through industrial foundations, through individual pilot farms like our own where the farmer can stick his hand into the soil and see what's happening and **know.**

I am sorry that I shall not have time to go into some of the nutritional aspects, because these people who believe only in organic farming, who say everyone will be poisoned by chemical fertilizers, are essentially wrong, in my opinion. On our farm we have seen our crops grow and increase largely through the use of chemical fertilizers, plus organic materials. We have seen them increase not only in yield but in quality. We have seen the signs of deficiency disappear—plants will show deficiencies even down to minor trace elements like manganese and boron. We have seen those

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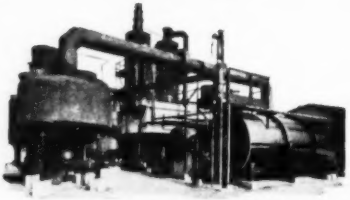

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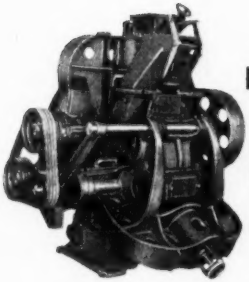

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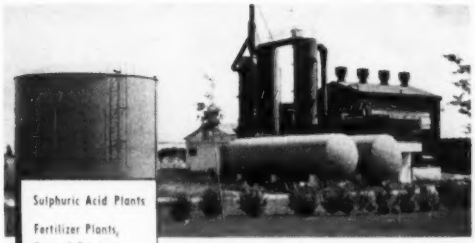

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disappear from our farm. We have likewise seen the ordinary diseases disappear in our heard of cattle as we raised the fertility and established the mineral balances in the soil. We have arrived at a point where we can say these two things to the farmer. We are absolutely keeping a clean record from mastitis, the dreaded disease of the dairy business, and we have not had a veterinarian on the farm for two and a half years except for tests or accidents—that was certainly not true when we took over that depleted, worn-out soil. Diseases have actually disappeared as we have increased our soil productivity.

McVICKAR

(Continued from page 30)

discover tangible evidence of the results—and actually have some measure of increased milk and livestock production. There have been numerous demonstrations from which farmers have not been able to learn the value of fertilization because only narrow strips of land have been used. In these instances, the cows have continuously and closely grazed the treated land so that to the untrained eye the fertilized area appeared less productive than that which had been fertilized. Had adequate acreage been fertilized, observers would not have been misled.

Fertilizer Brings Quick Response

3. Other pasture specialists have been stressing the need for complete fertilizers carrying in sufficient quantities all the nutrients needed for a quick growth on demonstration plots so that there will be an immediate response in pasture growth. Nothing is more impressive to farmers, they say, than the sight of lush vegitation quickly grown.

4. Let us be sure that farmers are persuaded to come to demonstrations several times during the course of the season. If this is done the farmers will obtain what they should have—a thorough understading not only of the ways in which to establish and maintain good pastures but also of the satisfactory results from standpoints of growth and money profits.

5. Possibly we can present the story more dramatically to farmers. Literature, including charts, might be made available giving such information as the amounts and costs of grass and legume seed, the proper methods of pasture care, the accepted grazing practices as adapted for the particular areas, and, of course, the increases in crop and money returns.

Don't Neglect Other Phases Of a Balanced Program

6. All such presentations should be well rounded. Fertility, of course, is the foundation of good pastures, but the use of fertilizer and fertilizer alone will not take the place of good management practices. If the land needs lime, certainly lime should be applied. If the pasture needs reseeding to improve varieties of grasses and clovers, reseeding should be done. Overgrazing kills

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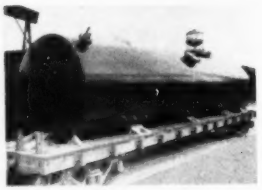

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the desirable plants and lets the weeds gain a foothold. Clipping the pasture with a mower as often as necessary to remove weeds and ungrazer clumps of grass is another part of a well rounded pasture program. Rotational grazing, when such can be practiced, not only increases the carrying capacity of the pasture but often is essential for the maintenance of stands of clover and other legumes in the pasture mixture.

7. Experience has shown that pasture tours are effective in stimulatin interest in the pasture movement. Members of the Plant Food Research Committee of NFA are convinced that one of the most valuable activities during the current year has been the tour which they conducted in cooperation with the colleges of agriculture in the States of North and South Carolina. More than 600 persons, many of them farmers, joined the tour at one point or another and doubtless returned home to practice and preach pasture improvement.

Why Not a "Pasture Month"?

8. Here is another idea. Would it not be desirable to set aside August for the celebration of National Pasture Month when all agencies, both Governmental and private, can work together as never before for the recognition of pasture work. Such an event would call for much advance planning and action but it would be worth the effort. The plans might well include proclamations by Governors, State and interstate contests, special pasture meetings and conferences and numerous other activities.

The pasture movement must be accelerated in the interest of sound American agriculture. We can all contribute to this program.

McCOLLAM

(Continued from page 34)

his own knowledge of how to make profits on dollars spent for fertilizer, the grower must finally accept its use as a regular operation in crop production, just as spraying or irrigating are necessary and regular operations.

Field crops and pastures seem destined to receive greater attention as fertilizer potentials in the West. The very large acreages of many of these crops have received but little fertilizer, and yields are declining badly in many areas.

The relatively small extent to which fertilizer has been used on grain crops has had an equally small amount of information to back it up. Of course, the wide-spread practice of broadcasting as a means of seeding grain crops left fertilizer in a bad position to start with. A separate operation was required for its application, and uneconomically large amounts were necessary for results when the fertilizer had to be scattered broadcast on the grain. The advantages of the grain drill with fertilizer attachment will come to be known more and more. This method, which drills the fertilizer with the grain, will also enable plant nutrients other than nitrogen to be used effectively on grain crops. It could well mean that early development of better root systems and cell structure would insure bigger grain crops even under seasonal moisture shortages or conditions favoring excessive transpiration and resultant grain shriveling. How to use fertilizer more effectively on our grain crops will receive more attention from western agronomists, and is definitely a promising part of our fertilizer potential.

Other Information Required

Much more information is needed about the time and method of placement of fertilizer in the soil so that the crop can make the best use of it. All of the far western States, notably Washington and California, have been looking into this matter, and this activity has never failed to yield valuable information. While there is now some use of fertilizer on cotton, the method of application is side dressing. What possibilities lie in an accurate placement of fertilizer at seeding time along with the seeding operation? Certainly combination seeding and fertilizer placement machines can be made available, and the advantages of giving the seedling cotton plant a successful early start in life might open up a very sizable fertilizer potential. Almost the same statements could be made for beans. The extensive acreages of this crop have never received much fertilizer, but a reappraisal of the needs of this crop along with methods of fertilizer application adds still more to the Far West's fertilizer potential.

The establishment of irrigated pastures has proceeded at a remarkably rapid rate and offers probably the best utilization of some of our

poorer types of soil. The livestock enterprise which usually goes along with it, together with the supplemental use of fertilizer, is the most effective means of improving this land and deriving profits from it. As the educational job progresses, fertilizers will be used in much greater volume to establish and maintain the productivity of these pastures.

Alfalfa, occupying vast acreages in the West, has been "pumping" some of the mineral plant foods from our soil in amounts that are apt to astound those who think of it from all angles as a soil builder. The time is here when we must give much more consideration to feeding the alfalfa crop some of these minerals it has been removing for so many years in our still unended era of soil mining. The decline in alfalfa yields and in the longevity of plantings will be studied from the nutritional side, along with the other possible contributing factors, and it is very probable that presently unknown needs for fertilizer use on alfalfa will be established. It is encouraging that nutritional surveys of alfalfa fields by means of plant analysis are currently being made in California, presumably to be followed by field trials to obtain fertilizer information on local application.

There are still other imposing potentials for fertilizer in the Far West which will be realized only as our agriculture becomes older, and as research and extension of information progress.

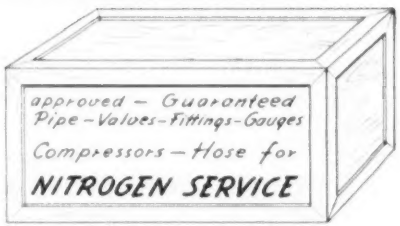
Role of Quality Products

The effect of a balanced fertilizer use on crop characteristics which go to make up desirable quality has not been extensively realized. The grower is becoming more and more burdened with off-grade produce as the markets become more particular. Because of our specialized crops and dependence on distant markets, the Far West must always be concerned with improving the quality of its produce. We must send to market produce that will appeal to the consumer more than competing products. The proper nutrition of crops may have a great part in accomplishing this. Effects of fertilizer have been largely measured in the past in terms of increased yields, and of course this pays off. But other effects we may call quality effects pay off too, not only to the grower but also to his marketing organizations. Evidence in this direction is accumulating, and as we broaden our knowledge of these added effects, we may assign to fertilizer still another role of importance.

To some of the eastern or southern States which use fertilizer by the million tons, the magnitude of our agriculture and the scantiness of our fertilizer use may seem strange when viewed together. We think, however, that we have now started to use fertilizer in a big way, and, more significant than this by far, we have started in a much bigger way to find out where and how effectively to use more of it in the Far West.

Approved Piping Equipment for NITROGEN SERVICE

Handling Nitrogen Solution, even under pressure, is an easy job for pipe, valves, fittings and other accessories that are designed for this corrosive job. Aluminum piping with "quick opening" valves designed to carry Nitrogen Solution, insure a trouble-free piping system that will carry this solution from the tank-car to your storage tank, and then to your mixer. Air hose, pipe and an adequate compressor to give the pressure you need for quick, efficient operation must be free from any copper or copper alloy connections, brazing, or welding.



A piping layout using these materials, is approved by all the major producers of this chemical. These materials are available from one source. Ask your Solution Representative, and write for free bulletin showing a detailed piping layout and complete "bill of materials".

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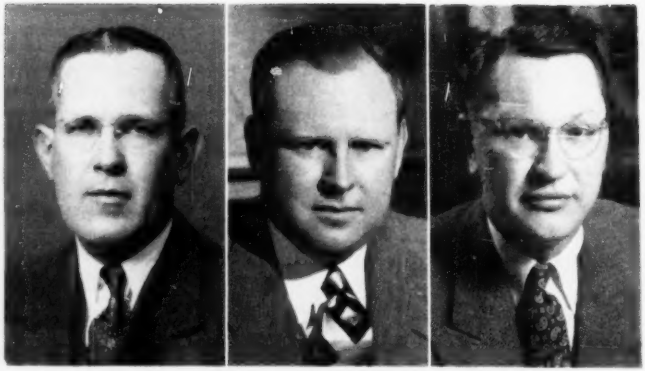
BALTIMORE

(Continued from page 36)

Modern Era In the Fertilizer Industry

What may be termed the modern era in the fertilizer industry in Baltimore began with the turn of the century, and was especially evident in the 1910's and 1920. New machinery, improved methods of production, better plant lay-out and design were advances which involved much new construction, alteration and reconditioning of existing plants. G. Ober & Co. and the American Agricultural Chemical Co. were the first local fertilizer plants to use electricity as motive power. This was in 1907. The World War demands from 1914, and on, served greatly to stimulate the industry and necessitated additional new construction. Full production continued during the post-war days and, with only small recessions, during the 1920's. This was a time of general prosperity. The depression of the '30's, of course, laid the fertilizer industry low. Within the past few years, however, it has partly recovered its losses. Agricultural prosperity invariably spells good business for those engaged in the production of fertilizers.

The latest U. S. Census figures (1947) show 14 fertilizer plants operating within the Baltimore industrial area, employing 3,127 factory workers, and producing fertilizer with a value added by manufacture of $19,865,000. That practically all fertilizer produced in Maryland is in and around Baltimore is shown by the fact that, omitting the Baltimore industrial area, the remainder of Maryland has 16 plants that employ only 314 workers.



Spencer Chemical Company has announced the following personnel changes. Left, Joe E. Culpepper, Assistant general sales manager, who has been moved to the post of General Sales manager. Center, John R. Riley, Jr., has been elected Vice President in charge of sales. Right, John P. Miller, former Treasurer, is now Vice President and Treasurer. All three men have been with the company for a long period of years.

Early Search for a Satisfactory Formula

Such is the story of the fertilizer industry in Baltimore. It now remains briefly to consider some of the outstanding individuals who possessed the knowledge, imagination and daring to create this great industry, which was for many years the second most valuable single line of manufacture in the city, and to sketch the beginnings and growth of a number of the more interesting and important of the fertilizer companies whose capable management made the industry's advance possible.

Thirteen years before the establishment of Baltimore's initial fertilizer plant in 1857, experiments looking toward future improvement in fertilizers were under way. R. J. Baker, druggist, who specialized in dyes, developed a new formula as early as 1837, and several other formulas in after years. From Baker's experiments there ultimately grew one of the city's largest fertilizer plants. In 1864 Baker admitted R. J. Hollingsworth into the firm and it was organized as R. J. Baker & Bro. Its factory was later established at Locust Point, where it covered two acres. This plant is said to be the first in Baltimore to have specialized in the preparation of "special formulas for special crops."

"Selling" Fertilizer in the 1850's

In the early '50's Maryland's state chemist was Dr. James John Hig-

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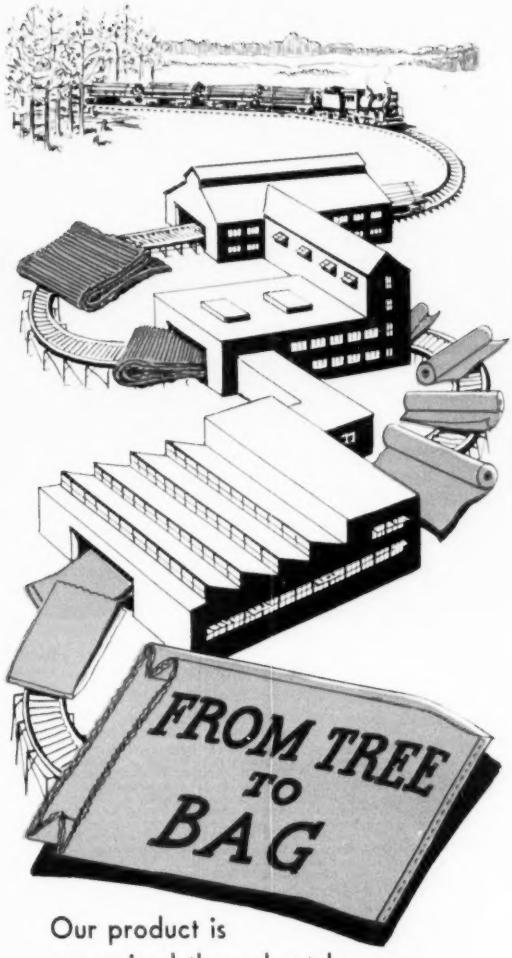

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gins. Maryland had been the first state to create such an office, and Dr. Higgins was the first individual appointed to this position. His duties bringing him into close contact with agricultural problems, Dr. Higgins became interested and developed quite a superior formula. Rather than capitalize on his success, however, Dr. Higgins promptly made public his discovery for the benefit of the people of his state. Still another claim to distinction by this noted agricultural chemist was that he was the first individual in the United States to introduce comparative pricing fertilizers. It was in 1851 that he placed a value of $46 per ton on Peruvian guano.

Maryland farmers were not given to "trying anything once." It was necessary that the manufacturers sell them on the benefits of the new fertilizer. The individual who did a lion's share of this work was B. M. Rhodes, operator of a large agricultural sales agency in Baltimore. He found it necessary to dispose of the improved fertilizers under an unusual agreement: he gave the farmers the fertilizer, and it was agreed that he would receive no payment unless the results were satisfactory. In one year he placed 75 tons with as many farmers, and in each instance Rhodes collected at the end of the season.

Maynard C. Wheeler, left, Vice President in Charge of Production of Commercial Solvents Corporation, has been elected to the Corporation's Board of Directors. He joined them in 1923 as a chemical engineer. Right, Dr. Roger W. Roth, who joined Commercial Solvents Corporation Agricultural Division as Entomologist with headquarters in New York. Simultaneously, the Corporation has announced the appointment of Dr. Richard S. Egly, as Director of Chemical Research in the Terre Haute Department. James W. Bulls, formerly Chemical Engineer in Charge of the Research Group at the Sterling plant, has been placed in charge of Chemical Engineering at Terre Haute. John J. Dorsey, who was previously in the Chemical Engineering Group at Terre Haute, replaces Mr. Bulls. Robert A. Shurtet has been made Assistant in Charge of the Microbiological Pilot Plant; R. R. Spiegelhalter, has joined the research staff as analytical chemist.

APFC STAGES FARM EDITOR TOUR

Thirty-three million Americans will know more about Florida's phosphate mining and processing industry because of an editors' tour through Hillsborough and Polk County mining areas recently.

Editors of 16 nationally known farm magazines having a total circulation of 11,000,000 copies (and it is estimated, generally, that each copy is read by at least three persons) made the one-day tour under the sponsorship of American Plant Food Council.

They arrived in Tampa by chartered plane and from there went to El Dorado, Texas, where they viewed nitrogen manufacturing plants. There were stops in Carlsbad, N. M., (to view potash mines and refineries); Joplin, Mo., (nitrogen manufacturing plants); and Dubuque, Iowa (mixed fertilizer factory), before the tour terminated at Chicago.

Visit Mines

The journalists went first to the Sydney (East Hillsborough County) mine of American Cyanamid Co. and there Arthur Crago, manager of that company, showed them mining and phosphate extraction operations. The visitors learned how giant draglines dig out the phosphate ore—a half millions tons annually from a mine expected to last for 10 years—and how the pebble and fine phosphate is extracted for shipment to the company's giant drying plant at Brewster.

The next stop was at the new Armour and Company plant in Polk County, where triple superphosphate is manufactured. Fred Coffee, E. C. Johnson and Frank Dunbar, Armour officials, conducted the tour of that plant. Briefly, the Armour operations provide for the manufacture of sulphuric acid (from sulphur, water and oxygen); the mixing of that acid with phosphate rock to produce liquid phosphoric acid; and the mixture of phosphoric acid and additional phosphate rock to produce triple superphosphate in a pelleted fertilizer concentrate form.

Go to Brewster

Through the mining community of Pierce, the visitors went on by bus to Brewster, the cozy company-owned town of American Cyanamid, for lunch. In the afternoon Crago led them on a tour of the giant plant where wet phosphate is received from the flotation plant at the mine, dried, ground and loaded into railway cars for shipment.

En route to Tampa, the group viewed another company-owned community, Nichols, owned by Virginia-Carolina Chemical Corp. A cocktail party and dinner were given in the visitors' honor.

Editors on the tour were: C. L. Mast, Jr., editor, Agricultural Leaders' Digest, Chicago; Ray Yarnell, editor, Capper's Farmer, Topeka, Kan.; Arnold Nicholson, managing editor, Country Gentleman, Philadelphia; Ralph D. Wennblom, associate editor, Farm Journal, Philadelphia; William H. Kircher, associate editor, The Farmer, St. Paul, Minn.; Ferdie Deering, editor, The Farmer-Stockman, Oklahoma City, Okla.; Eugene Meyer, associate editor, Hoard's Dairyman, Fort Atkinson, Wis.; Milon Grinnell, editor, The Michigan Farmer, East Lansing, Mich.; Earl McMunn, editor, Ohio Farmer, Cleveland; M. C. Gilpin, managing editor, The Pennsylvania Farmer, Harrisburg, Pa.; Jim Thomson, managing editor, Prairie Farmer, Chicago; W. C. Lasseter, vice president and editor, The Progressive Farmer, Memphis, Tenn.; L. R. Neel, editor, Farm and Ranch-Southern Agriculturist, Nashville, Tenn.; Paul D. Sanders, editor, The Southern Planter, Richmond, Va.; Jim Roe, managing editor, Successful Farming, Des Moines, Iowa, and Merrill Gregory, managing editor, Wallaces' Farmer and Iowa Homestead, Des Moines, Iowa.

Sponsors

Fred J. Woods of Tampa, president of The Gulf Fertilizer Company, was chairman of the Florida committee in charge of arrangements for the tour. Other members of the committee were Guy D. Austin, Miami; F. F. Coffee, Jacksonville; Arthur Crago, Brewster; B. A. McCown, Orlando, and C. F. Daly, Glenn Lucas, G. D. Sloan and W. L. Waring, all of Tampa.

Florida manufacturers in the American Plant Food Council include: Guy D. Austin Co., Miami; The Gulf Fertilizer Co., Tampa; Lyons Fertilizer Company, Tampa; Superior Fertilizer Co., Tampa; West Coast Fertilizer Co., Tampa; and Wilson and Toomer Fertilizer Co., Jacksonville.

With the visiting group were Frank Holland, of Winter Haven, manager of Florida Agricultural Research Institute; Milton Plumb, farm editor of The Tribune; Carlisle Kyle, editor of Citrus magazine; and Dr. John H. Taylor, agronomist, and Louis H. Wilson, public information director for American Plant Food Council.

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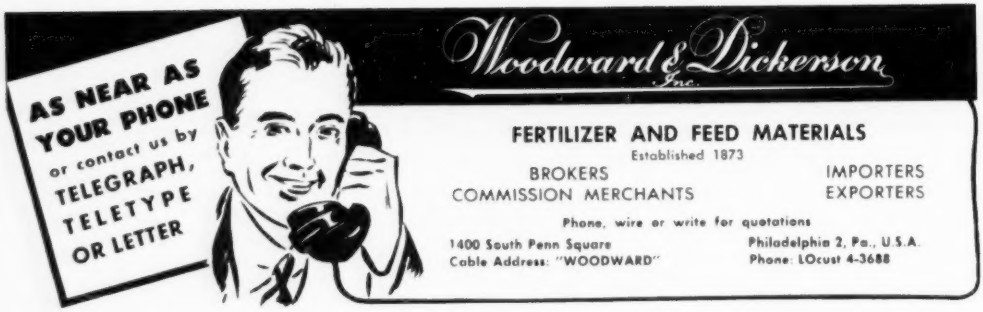

MARKETS

Tag Sales, Shipments Show Gains

Combined tax tag and fertilizer shipment statistics from 12 southern and midwestern States show that September figures were approximately four percent higher than those of the same month last year. The National Fertilizer Association, which compiles the statistics, reports that during the first eight months of 1950, the South reported a total of 6,665,000 equivalent short tons, or about four percent more than during January-August of last year, while the three midwestern States recorded 1,483,000 tons, or a gain of 19 percent over the corresponding 1949 total. During the first two months of the current fiscal year, the South, with a total of 385,000 tons, surpassed its year-ago figure by more than 20 percent, while the Midwest tonnage rose by the same percentage from 270,000 to 326,000.

FERTILIZER TAX TAG SALES AND REPORTED SHIPMENTS
(In Equivalent Short Tons)
Compiled by The National Fertilizer Association

STATE	September 1950	September 1949	January-August 1950	January-August 1949	July-August 1949-50	July-August 1948-49
Virginia	34,624	56,228	559,517	540,697	47,735	46,710
N. Carolina		53,245	1,459,538	1,284,572	34,744	23,686
S. Carolina	50,340	35,435	739,835	785,089	34,220	22,517
Georgia	40,667	44,300	983,576	1,031,873	27,271	15,451
Florida	78,161	53,677	652,435	593,405	82,287	77,942
Alabama	22,137	17,179	870,513	912,174	46,218	35,322
Tennessee	29,056	18,105	397,240	377,680	24,502	16,948
Arkansas	6,303	7,390	313,265	283,961	23,135	16,784
Louisiana	11,496	8,665	217,306	197,731	12,825	12,586
Texas	56,275	47,547	370,489	322,220	38,959	32,372
Oklahoma		24,121	101,027	87,759	12,715	16,749
TOTAL SOUTH		365,892	6,644,741	6,417,161	384,611	317,067
Indiana	42,379	49,195	638,419	542,379	172,930	177,059
Kentucky	13,670	26,646	463,124	364,776	63,717	40,107
Missouri	74,037	77,305	381,764	339,465	89,049	53,058
TOTAL MIDWEST	130,086	153,146	1,483,307	1,246,620	325,696	270,224
GRAND TOTAL		519,038	8,148,048	7,663,781	710,307	587,291

2/ Not available for this issue.

ORGANICS: The market on Organics continues firm and those suitable for fertilizer use are difficult to obtain at reasonable prices. Domestic Nitrogenous Tankage is nominally at $4.10 to $4.50 per unit of Ammonia, f.o.b. production point in bulk, but the three major producers are sold up for the entire season. Limited lots of foreign Nitrogenous appear occasionally on the market at around $5.50 to $5.75 per unit of Ammonia CIF Atlantic ports.

CASTOR POMACE: Limited supplies have been offered recently for fall and January shipment at $5.50 per unit of Ammonia in bags, f.o.b. Northeastern production points. This material is guaranteed 5.75% Ammonia as compared to the usual guarantee of 6.75% Ammonia. A very limited quantity has been offered at $37.50 per ton in bags, minimum 6.75% Ammonia.

DRIED GROUND BLOOD: The Chicago market is quiet at around $8.25 to $8.50 per unit of Ammonia in bulk, with the New York market approximately the same.

POTASH: Movement to consumers continues at a steady pace against contracts, temporarily interrupted from time to time by box car shortages. Production continues at capacity. The price for spot sales is now 42c per unit of K_2O, f.o.b. Carlsbad, for bulk Muriate.

GROUND COTTON BUR ASH: Supplies in Texas continue considerably short of the production during the past season with producers reluctant to offer for future shipment.

PHOSPHATE ROCK: Movement to domestic consumers is at seasonal volume. Shortage of Sulphuric Acid in certain areas is causing decreased shipment of Phosphate Rock to the affected areas.

SUPERPHOSPHATE: This market is becoming considerably firmer as the shortage of Sulphuric Acid is having its effect. Price of Sulphuric Acid generally has been advanced resulting in higher prices for Superphosphate in many production areas. Demand for Triple Superphosphate exceeds supply considerably.

SULPHATE OF AMMONIA: Movement from Coke Oven production points continues steady maintaining stock at low levels. Synthetic material for export is scarce and firm with price around $40.00 to $42.00 per FAS Gulf Ports.

AMMONIUM NITRATE: Supplies continue scarce both from domestic and foreign sources. Demand is in excess of supply. No recent change in prices have been noted.

NITRATE OF SODA: This market continues firm without any change in prices.

Supply is adequate and demand seasonal.

GENERAL: Superphosphate during the coming season is expected to be very firm in price and possibly supply slightly short of demand due to the tight position of Sulphuric Acid which is necessary for the production of Superphosphate. Other fertilizer materials are in firm market position with prices tending upward.

Baughman Distributors Meet

A convention for distributors of the Baughman Manufacturing Company was held at the Company's factory, Jerseyville, Ill., Nov. 6, 7 and 8, the purpose of the convention to acquaint distributors first hand with the complete line of Baughman equipment and to outline sales and advertising plans for 1951. The meeting closed with a banquet Wednesday night, Nov. 8, in the main dining room of Pere Marquette Lodge on the Illinois River.

Baughman manufactures belt, screw and chain and flight conveyors, belt and bucket elevators and self-unloading truck bodies. More than 100 distributors from coast to coast handle the Baughman line.

PROGRAM

Twenty-Sixth Annual Meeting of the National Joint Committee on Fertilizer Application

Held Jointly with the Power and Machinery Division of the American Society of Agricultural Engineers

December 18, 1950, Chicago, Illinois

General Chairman A. L. Lang Presiding

MORNING MEETING 9:45 a.m.

1. Improvement of Soil Productivity by Soil Management and Through the Use of Chemical Fertilizers and Organic Materials.
   Frank W. Parker, U. S. Department of Agriculture—30 minutes
2. Review of Commercially Available Fertilizer Distribution Equipment and the Kodachrome Slide Library.
   Glenn A. Cumings, U. S. Department of Agriculture—15 minutes
3. Special Equipment Developed for Experimental Application of Fertilizers.
   O. C. French, Agricultural Experiment Station, Cornell University—15 minutes
4. Where Should the Fertilizer be Placed for Corn?
   George D. Scarseth, American Farm Research Association—15 minutes
5. Most Promising Methods of Application of Fertilizers to Pastures.
   D. R. Dodd, Ohio State University—15 minutes

Adjournment 11:30 a.m.

AFTERNOON MEETING 1:30 p.m.

6. Principles Involved in the Placement of Fertilizer to Truck Crops.
   C. H. Mahoney, National Canners Association—30 minutes
   J. D. Barnard, Minnesota Valley Canning Company—30 minutes
7. Present Status of Use of Liquid and Gaseous Fertilizers, Their Advantages and Limitations.
   Proctor W. Gull, Spencer Chemical Company—15 minutes
8. Aircraft Application of Fertilizers.
   M. H. McVickar, The National Fertilizer Association—15 minutes
9. The Fertilizer Manufacturer's Problems, What Can Be Expected in Improved Physical Characteristics of Fertilizers to Aid the Farm Implement Manufacturer?
   Maurice H. Lockwood, International Minerals & Chemical Corp.—30 minutes
10. The Fertilizer Equipment Manufacturer's Problems in Design.
    C. E. Guelle, International Harvester Company—30 minutes
    W. W. Trantor, A. B. Farquhar Company—30 minutes
    W. A. Hyland, Van Brunt Mfg. Company—30 minutes

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Around the Map

FLORIDA

The Howard Fertilizer Company, Orlando, was the only bidder for the leasing of 130 acres of public phosphate lands in Florida. They offered $25 an acre for 80 years in Citrus County, and $105 an acre for 50 acres in Hernando County.

* * *

Cartledge Fertilizer Plant, Cottondale suffered damage of around $1500 recently when a hydrogen tank is said to have exploded.

GEORGIA

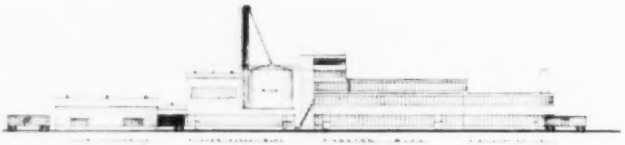
Cotton Producers Association, Carrollton, are hopeful of getting the necessary building materials to replace the plant destroyed by fire at the end of August, according to **Sam Burns,** association president. The fire destroyed a $300,000 establishment, including some $70,000 of new equipment and a $12,000 addition.

LOUISIANA

Green & Reedy Fertilizer Company, Baton Rouge, which was reported in this department last month, has been granted $125,000 tax exemption by the Board of Directors of the Louisiana Department of Commerce and Industry.

* * * *

Gulf Grinders and Distributors, Inc., fertilizers, etc., filed articles of incorporation with the secretary of state office at Baton Rouge, La., during the week of October 14, 1950. Capital stock was listed at $150,000.



An architect's drawing of the site of Quaker Oats Company Omaha Chemical plant, which, when completed, among other things, produce furfural for the fertilizer trade. Work has just begun on the plant which was announced some months ago in Commercial Fertilizer.

MISSOURI

Buford Everett and **Ray Clark,** of Plattsburg, formally opened their new bulk phosphate plant October 7. The program included a message of welcome from Mr. Everett and Mr. Clark, and discussions by distinguished members of Missouri's Agricultural forces.

Soon after the close of World War II, this South Point (Ohio) plant was purchased by Allied Chemical & Dye Corporation (The Solvay Process Division), and since has been producing various Barrett Nitrogen products for American agriculture and industry. Production of nitrogen at South Point, along with other nitrogen fixation plants, has helped to make America independent of foreign sources of nitrogen. To serve the Midwest region, the Barrett Division recently opened an Agricultural Development and Sales office at South Point.

NEW YORK

Cooperative Grange League Federation Exchange has opened its new fertilizer plant on Cabbage Island, which was reported here recently. The plant estimated to cost $300,000 to $400,000 will replace the old GLF plant in the same vicinity. Construction was started in the summer of 1949 and completed last month. Cutting of the ribbon was by Obe Sheldon, Millbrook, former GLF district manager in Albany.

TEXAS

Hi-Yield Fertilizer Company, Bonham, has added complete insecticide service to its fertilizer service, according to **Dean Smith,** president and general manager. Mr. Smith, as recorded here some months ago, was formerly with Red Star at Sulphur Springs, Florida. **Pat Gowan,** another Red Star man is now Hi-Yield's plant manager.

VIRGINIA

Richmond Guano Company, Richmond, has made good progress on its $250,000 plant addition. Automatic superphosphate equipment costing around $150,000 is to be installed, according to **L. D. George**, secretary.

JAPAN

Nissin Chemical Company, Osaka, has signed a contract with Chemical Construction Corporation, New York, covering engineering designs for a modern urea plant to be located at an existing plant site of the Nissin Company, which is one of the largest chemical producers in Japan, and was formerly known as the Sumitomo Chemical Company, Ltd.

Bemis Announces New Gravity Packer

A new Bemis Gravity Packer for packing free flowing commodities in either cotton or paper bags has been developed by the Bemis Bro. Bag Co. Packaging Service. This new machine is a combined filling, weighing, and bag closing unit, so designed that it can be operated with either a one man or two man crew, and will accurately pre-weigh and pack.

The 1950-51 Bemis calendars are in the mail. This year the illustrations go into the home, industry, the farm to show how often Bemis products serve our daily lives.

Coke Oven Ammonia Research Offices Moved

The offices of the Coke Oven Ammonia Research Bureau, Inc., have been moved to Suite 805, Atlas Building, 8 East Long Street, Columbus 15, Ohio. It was formerly located at 50 West Broad Street.

CONTROL OFFICIALS MEET; ELECT BERRY

Photograph taken at the dinner given by the National Fertilizer Association for the Chemical Control Committee, October 6th.

One hundred and thirty-three state fertilizer control officials, government workers and members of the fertilizer industry from 42 states and the District of Columbia attended an interesting and well planned program of the Association of American Fertilizer Control Officials at the Shoreham Hotel in Washington on October 6, 1950.

President John B. Smith of Kingston, R. I. in his Presidential address entitled "Policies and Progress" stressed the importance of promoting uniform and effective legislation, definitions and enforcement of law relating to the control of sale and distribution of mixed fertilizers and fertilizer materials.

President Smith thanked the two fertilizer trade associations, members of the industry, investigators and control officials for their splendid cooperation.

Dr. Russell Coleman, Washington, D. C., President of the National Fertilizer Association, spoke briefly and pledged the continued cooperation of his organization and pointed out the progress being made by the fertilizer industry.

Due to the untimely passing of C. A. Woodrum, President of

OFFICERS ELECTED FOR 1950-51

President, R. C. Berry, Richmond, Virginia; Vice-President, J. F. Fudge, College Station, Texas; Secretary-Treasurer, B. D. Cloaninger, Clemson, South Carolina.

EXECUTIVE COMMITTEE

The President, Vice-President, Secretary-Treasurer, and Retiring President Ex Officio:

W. S. Thompson, Columbus, Ohio, 1953; G. W. Michael, Ottawa, Canada, 1953; J. D. Patterson, Salem, Oregon, 1951; Parks Yeats, Chairman, Oklahoma City, Okla., 1951.

The American Plant Food Council, on October 6, 1950 no representative of the Council appeared on the program.

Dr. Kenneth C. Beeson, U.S.D.A., Ithaca, N. Y. presented an excellent paper on the subject "Comparative Effects of Organic and Inorganic Fertilizers on the Nutritional Quality of Crops." After a thorough presentation pertaining to the above topic, Dr. Beeson concluded by saying, "Attacks have been made in recent years on commercial or 'chemical' fertilizers by proponents of organic fertilizers or composts. Little, if any, real evidence is offered to support the contention that commercial fertilizers result in nutritional trouble in man. It is recognized that it is difficult to obtain the truth because of the complications inherent in experiments of this kind. The question may be raised as to whether valid comparative experiments can be set up to measure the effects of composts as compared to inorganic compounds on nutritional value in plants. In general the results obtained so far do not indicate any important differences in vitamin or mineral content of vegetables grown with compost as compared to commercial fertilizers. If, however, we are to supply an adequate diet for man, we must have an abundant supply of fertilizers."

Walter Scholl of the U.S.D.A., Beltsville, Md. presented an excellent paper, along with suitable charts on the subject "Composition of Mixed Fertilizers in Relation to Guarantees."

"Developing a Pasture Program in Virginia" was discussed by Dr. H. L. Dunton, Head, Agronomy Department, Virginia Polytechnic Institute, Blacksburg, Va. Dr. Dunton stated that there is more interest and enthusiasm in the pasture program than there was in the corn program at a comparable stage of development and that farmers realize that an intensive pasture program can mean much to the Virginia economy. He further pointed out that the pasture program was too large for any one group or agency to handle, and that it was therefore not the program of any one organization or agency in Virginia but the Virginia Pasture Program. He stated that commercial agencies, such as the fertilizer industry, are cooperating very closely with the program. As an example, representatives of the industry have helped to organize and conduct hundreds of Pasture Tours during the 1950 season. Previous to that the industry helped locate and set-up pasture demonstrations.

Clifton A. Woodrum's sudden passing came just before press-time last month and we could only hold the presses for a brief obituary then. He served as President of American Plant Food Council from its inception in June, 1945, resigning from the House of Representatives in order to give his fine talents to the progress of our industry. He will be sorely missed in our leadership.

The subject "History and Present Status of The Magruder Check Fertilizer Sample" was discussed very interestingly and authoritatively by Dr. S. F. Thornton, Director, Chemical Control and Farm Service, F. S. Royster Guano Company of Norfolk, Va. Dr. Thornton states that the early records that do exist make it appear certain that the idea of a monthly check sample grew out of an informal exchange of samples at irregular intervals among a group of fertilizer laboratories. The records show that the number of analysts cooperating in the check sample have grown from 29 in November 1922 to 96 at present. He further states, that the "Current policy is identical with that announced on November 14, 1922. It is the aim of the sponsors of this work to provide a check sample on which the cooperators may work and to distribute the results of this work so that each participant may have the opportunity to study the results of all other participants to the end that his own methods and techniques may be improved. The need for this service appears to be fully as great as it was in 1922."

L. C. Jacobs, Supervisor, Feeds, Seeds and Fertilizers, Nashville, Tenn., discussed the subject "The Reporting System vs Tax Tags."

Dr. M. D. Farrar, Head, Department of Entomology and Zoology, The Clemson Agricultural College, Clemson, S. C. presented a paper on the subject "Insecticides in Fertilizers." Dr. Farrar said "The introduc-

tion of the chlorinated hydrocarbons as insecticides brought about a new era for the control of insects that feed in the soil. Previously sterilization with steam, the injections of fumigants, or the addition of arsenical poisons to soils were used. These methods were unsatisfactory due to high cost and low efficiency. At their best they proved only partially effective and repeated treatments were often necessary." He stated further that "Fields treated with insecticide-fertilizers have, in many cases, shown tremendous response in increased crop stand and production. Farm demonstrations have been so outstanding that farmers have requested the fertilizer manufacturers to mix insecticides with their fertilizer, but this practice was not in conformity with fertilizer laws or regulations. To permit the addition of insecticides to a fertilizer mixture, several states have now issued regulations governing the added chemicals in the mixture. Generally the regulations require the bags to be marked or tagged to show the weight of chemical added to each bag."

Copies of all talks, along with the revised definitions of fertilizer terms, model uniform fertilizer bill and names and addresses of all fertilizer control officials in the United States will appear in the official publication, No. 4. This publication will be available for distribution in January 1951 at $1.00 per copy. Orders may be placed with the Secretary-Treasurer, B. D. Cloaninger, P. O. Box 392, Clemson, S. C.

Personals

A. H. Sterne, wife and daughter Sue Brown, have returned from a three and one-half months trip to South Africa. **Mr. Sterne** is Vice President of **Tennessee Corporation**, Atlanta.

* * *

Dr. W. L. Judefind has been made assistant to **Dr. G. M. Hebbard**, Vice President of Operations, **Davison Chemical Corporation. T. O. Tongue** has been made Manager of Process and Quality Control at the Curtis Bay plant. **Dr. P. L. Veltman** has been made Manager of the Research and Development Division at the Curtis Bay plant, under **Dr. C. E. Waring**, Vice President of Research and Development.

* * *

Frank N. Turner has been appointed assistant sales manager of the **Florida Agricultural Supply Company**, a division of **Wilson & Toomer Fertilizer Company**, Jacksonville. He succeeds the late **D. L. Evans, Jr.**, who died several months ago of automobile injuries. The appointment was announced by **M. C. Van Horn**, Manager of the concern.

* * *

E. L. Anthony, dean of agriculture at **Michigan State College**, has been reappointed for a three-year term to the Michigan Economic Development Commission.

* * *

Willis M. Cooper, assistant to the managing director of **Monsanto Chemicals Limited**, London, Eng., has been appointed assistant director of Monsanto's General Engineering Department, St. Louis, Mo., **William T. Nichols**, department director, has announced. The appointment will be effective Dec. 1. Mr. Cooper joined Monsanto in 1935 as a laboratory analyst.

* * *

Alvin J. Hinson, Plant City, Florida fertilizer manufacturer, has been named vice-chairman of a committee to memorialize the builder of the Tampa Bay causeway.

Pennsalt Opens New Coast Office

The Pennsylvania Salt Manufacturing Company today announced the opening of a new sales office in the Woolsey Building, 2168 Shattuck Ave., Berkeley, Calif., to serve industry and agriculture of the western states.

Making their headquarters at the new office will be R. A. Snyder, who will do technical sales service work for metal and maintenance cleaners in industries of California, and J. Cameron Siddall, who will handle technical sales and service for agriculture in California, Arizona and New Mexico.

Bear Addresses N. E. Conservation Group

"The fertilizer industry represents the most important chemical development, in terms of human values, the world has ever known," Dr. Firman E. Bear, president of the Soil Conservation Society of America and chairman of the Soils Department at the New Jersey Agricultural Experiment Station, said to an audience of 75, at the annual meeting of the Southern New England Chapter of the Soil Conservation Society of America, held at the Connecticut A.E.S.

CLASSIFIED ADVERTISING

For Sale, Exchange and Wanted Advertisements, same type now used. EIGHT CENTS a word for one insertion; TWELVE CENTS a word for two insertions; FIFTEEN CENTS a word for three insertions, and FOUR CENTS a word for each insertion more than three. ADVERTISEMENTS FOR THIS COLUMN MUST BE PAID IN ADVANCE.

FOR SALE: Complete ¼ Ton Utility Mixing Plant completely reconditioned and painted. Will quote delivered basis within 350 miles of Greenville. Delta Fertilizer Works, Greenville, Mississippi.

FOR SALE: Dry Mixing Fertilizer Plant, 10,000 ton capacity, well equipped. Located in splendid farming section of North Carolina. Well contracted for materials. Box No. 6, c/o Commercial Fertilizer, 75 Third St., N.E. Atlanta, Ga.

WANTED—CHEMICAL ENGINEER: Independent Fertilizer Plant on South Atlantic Coast requires man familiar with Sulphuric Acid manufacture of Box Chamber Plant with Ammonia Oxidation Unit. Applicant must be in good health but free from call by the Armed Forces. Box 5, c/o Commercial Fertilizer, 75 Third St., N. W. Atlanta, Ga.

FOR SALE: Exact weight sacking scale Model 2225. Like new, used one season. KOVA FERTILIZER, INC., GREENSBURG, INDIANA.

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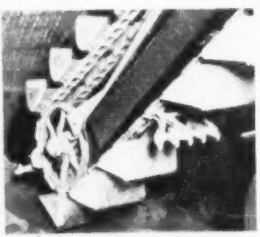

DIGS and LOADS

Jeffrey Digger and Loader keeps the large storage hopper well filled. Loaded in a few minutes. Has renewable digger teeth attached to sturdy malleable buckets and digger tools spaced at intervals on the chain. Also — sprockets, chains and attachments, conveyors, elevators, crushers and pulverizers.

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The coming century presents a many sided challenge:

1. Increasing Populations.
2. Increasing Standards of Living.
3. Increasing Economic Problems.
4. And above all, an Increasing and Urgent Demand for the Preservation of the Fertility and Productivity of our Greatest Heritage—The Good Earth.

We pledge our best efforts to the attainment of all constructive objectives.

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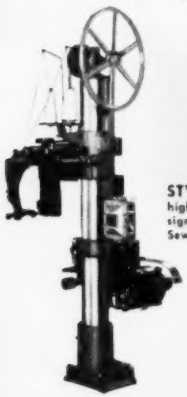
BAG CLOSING MACHINES

Engineered

STYLE 21800 H *(Left)*, equipped with 80600 H sewing head, is designed for fast, economical closing of paper bags. Bag is sewed, tape-bound, and tape is cut off neatly at each end of closure. Sewing head and conveyor adjustable vertically.

CLASS 20500 *(above)* machines are heavy duty, high production units for closing medium and heavy weight bags. Available with power-driven horizontal conveyor, inclined conveyor, or both; or with conveyor transmission unit only, for plant production line.



STYLE 20100 H *(left)*, is a heavy duty, high production column type machine designed for use with plant conveyor systems. Sewing head is pedal controlled.

DUPLEX MACHINES *(right)* are designed for closing double bags. The first sewing head closes the inner bag; the second closes either the outer bag alone, or both bags together for extra safety. Also recommended for single closures where continuous operation is a must — operator can instantly switch to other head.

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No two jobs are exactly alike — that's why Union Special builds a wide variety of bag closing equipment. In the Union Special line you will find machines for closing all sizes and kinds of bags from small textile or paper bags of one pound, or less, up to the largest jute or multiwall paper bags in use today. And whether your schedule calls for closing just a few bags or for high continuous output, Union Special can supply the equipment to do the work efficiently, economically, dependably! FOR THE BEST IN BAG CLOSING EQUIPMENT, LOOK TO UNION SPECIAL. See your Union Special representative for recommendations, or write.

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It's easy to find just the right unit to meet your individual needs in Union Special's big line of bag closing machines. Twenty-five different styles of machines! Ten styles of sewing heads! Wide choice of conveyors, controls, and types of closures. Ask for a copy of Bulletin No. 200, "UNION SPECIAL FILLED BAG CLOSING MACHINES."

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